A CLOUD GURU

Table of Contents

AWS CERTIFIED CLOUD PRACTITIONER

Hello!

Welcome to the course.

The cloud has become a key enabler for innovation with beneficial features like high availability, unlimited capacity, on-demand scalability, elasticity, cost savings, and more! Many companies realize the ever-evolving **Amazon Web Services (AWS)** cloud computing platform offers a wide selection of services that drive innovation, enable scalability, and maximize IT spend.

If you have little to no experience with AWS, this course is designed to help you obtain the knowledge and skills required to become an **AWS Certified Cloud Practitioner**. By taking this course, you will gain an understanding of key AWS technologies, their use cases, and the costs and benefits of working with AWS Cloud environments.

In this course, you'll learn:

- ☑ **The foundations of cloud computing**
- ☑ **The core AWS services, including compute, network, databases, and storage**
- ☑ **Security best practices and compliance in the AWS Cloud**
- ☑ **The cloud costs, economics, and billing practices of the AWS Cloud**

By the end of this course, you'll understand AWS services and how they are leveraged to build applications and provide products and services in the real world. Join your instructor, **Kesha Williams**, and prepare to become an **AWS Certified Cloud Practitioner**!

Introduction

Let's review the topics we'll cover in this section.

Course Introduction

This lesson introduces the objectives and topics covered in the course and the course scenario.

Exploring the Exam Blueprint

In this lesson, you'll learn about the four exam domains: Cloud Concepts, Security and Compliance, Technology, and Billing and Pricing.

Foundations of Cloud Computing

Let's review the topics we'll cover in this section.

Understanding Cloud Computing

Cloud computing provides on-demand access to resources over the internet with pay-as-you-go pricing. In this lesson, we go over cloud computing and its benefits, characteristics of the cloud, and the different cloud computing models.

Exploring the Advantages of Cloud Computing

In the lesson, we will explore the 6 advantages of cloud computing.

Reviewing Cloud Computing and Deployment Models

In this lesson, we review the cloud computing and deployment models.

Leveraging the AWS Global Infrastructure

AWS offers a global infrastructure. In this lesson, we discuss Regions, Availability Zones, edge locations, and more.

Exploring Your Amazon Web Services (AWS) Account

There are several services and ways to access your AWS account. In this lesson, we explore the AWS Management Console and the services automatically set up for you in your Free Tier account.

Technology

Let's review the topics we'll cover in this section.

Section Introduction

In this lesson, we explore the learning objectives for this section.

Exploring Compute Services: EC2

In this lesson, we go over EC2 instances, instance types, pricing options, load balancing, and Auto Scaling.

Exploring Compute Services: EC2 in Action

In this lesson, we go through a demo of EC2.

Exploring Compute Services: Lambda

In this lesson, we explore AWS Lambda.

Exploring Compute Services: Additional Compute Services

In this lesson, we'll explore Fargate, Lightsail, Outposts, and Batch.

Leveraging Storage Services: S3

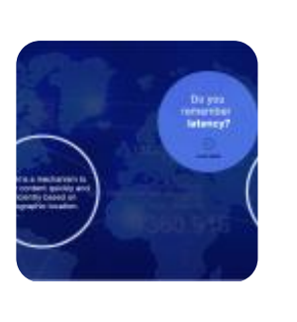
S3 allows you to store objects in the cloud and offers scalability, data availability, security, and performance. In this lesson, we cover what S3 is and the many object storage classes.

Leveraging Storage Services: S3 in Action

Let's see the process to create an Amazon S3 bucket and upload objects.

Leveraging Storage Services: Additional Storage Services

In this lesson, we learn about additional storage services, like EBS, EC2 instance storage, EFS, and Storage Gateway.



Understanding Content Delivery Services

A content delivery network (CDN) delivers your content globally with low latency and high transfer speeds. In this lesson, we go over CDN services provided by AWS.

Understanding Networking Services: VPC and Subcomponents

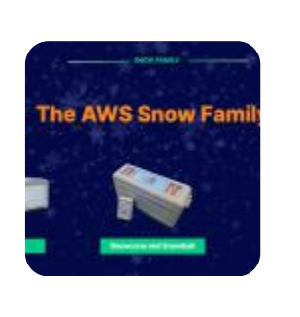
In this lesson, we cover VPCs and associated subcomponents like subnets, NACLs, route tables, and internet gateways.

Understanding Networking Services: Additional Networking Services

In this lesson, we go over additional networking services, like Route 53, Direct Connect, and AWS VPN.

Utilizing Databases

There are many database services. In this lesson, we explore relational databases, in-memory data stores, NoSQL databases, and more.



Exploring Migration and Transfer Services

There are many ways to migrate data to AWS. In this lesson, we cover the Snow Family of products, DMS, SMS, DataSync, and more.

Leveraging Analytics Services

There are many analytics services on AWS. In this lesson, we go over Redshift, Kinesis, Athena, and more.

Leveraging Machine Learning Services

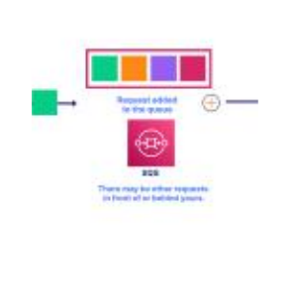
In this lesson, we cover machine learning services like SageMaker, Rekognition, Comprehend, Transcribe, and more.

Understanding Developer Tools

There are many tools to aid in development. In this lesson, we explore coding, building, and deployment tools.

Exploring Deployment and Infrastructure Management Services

There are many deployment and infrastructure management tools. In this lesson, we cover Elastic Beanstalk, CloudFormation, and more.



Utilizing Messaging and Integration Services: SQS

There are many messaging tools. In this lesson, we go over SQS.

Utilizing Messaging and Integration Services: SNS and SES

There are many messaging tools. In this lesson, we cover SNS and SES.

Exploring Auditing, Monitoring, and Logging Services

There are many auditing, monitoring, and logging services. In this lesson, we discuss CloudTrail, CloudWatch, AWS Config, and more.

Section Review

In this lesson, we review what we've learned in this section and highlight what you will learn next.

Security and Compliance

Let's review the topics we'll cover in this section.

Section Introduction

Let's discuss what we'll learn in this section.

Understanding the Shared Responsibility Model

In this lesson, you'll learn about the shared responsibility model, which outlines your responsibilities vs AWS' when it comes to security and compliance.

Leveraging the Well-Architected Framework

In this lesson, we'll explore the well-architected framework that describes design principles and best practices for running workloads in the cloud.

Understanding IAM Users

In this lesson, you'll learn about creating and managing users. You'll also learn best practices and useful reports that allow you to view the status of all user credentials.

Understanding IAM Permissions

In this lesson, you'll learn best practices and useful reports that allow you to view the status of all user credentials.

Exploring Application Security Services

There are many services you can use to protect your systems. We'll discuss firewalls, stopping malicious traffic, and detecting vulnerabilities.

Exploring Additional Security Services

In this lesson, we'll explore additional application security services.

Utilizing Data Encryption and Secrets Management Services

There are many additional security services provided by AWS. We'll discuss ways to encrypt your data, generate your own encryption keys, and retrieve secrets.

Section Review

Let's review what we learned in this section.

Pricing, Billing, and Governance

Let's review the topics we'll cover in each section.

Section Introduction

In this lesson, we explore the learning objectives for this section.

Understanding AWS Pricing

With AWS pricing, you only pay for the services you use, for as long as you use them. In this lesson, we cover how pricing works and explore tools that help you determine total cost.

Understanding Billing Services

There are several tools available to track your ongoing spend. In this lesson, we explore ways to visualize and manage AWS costs and usage over time.

Exploring Governance Services

In this lesson, we'll explore ways to consolidate billing for multiple AWS accounts and govern a multi-account AWS environment.

Utilizing Management Services

In this lesson, we talk about the support provided as you prepare planned events, product launches, and migrations.

Exploring Support Plans

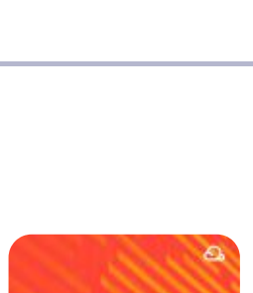
AWS offers several support plans to fit your needs and budget. In this lesson, we'll discuss each support plan.

Section Review

In this lesson, we review what we've learned in this section and highlight what you will learn next.

Conclusion

Let's review the topics we'll cover in this section.



Conclusion and What's Next

In this lesson, we'll review everything we've learned and discuss what's next on your learning journey.

A CLOUD GURU

AWS Certified Cloud Practitioner

LESSON BREAKDOWN

1 Introduction

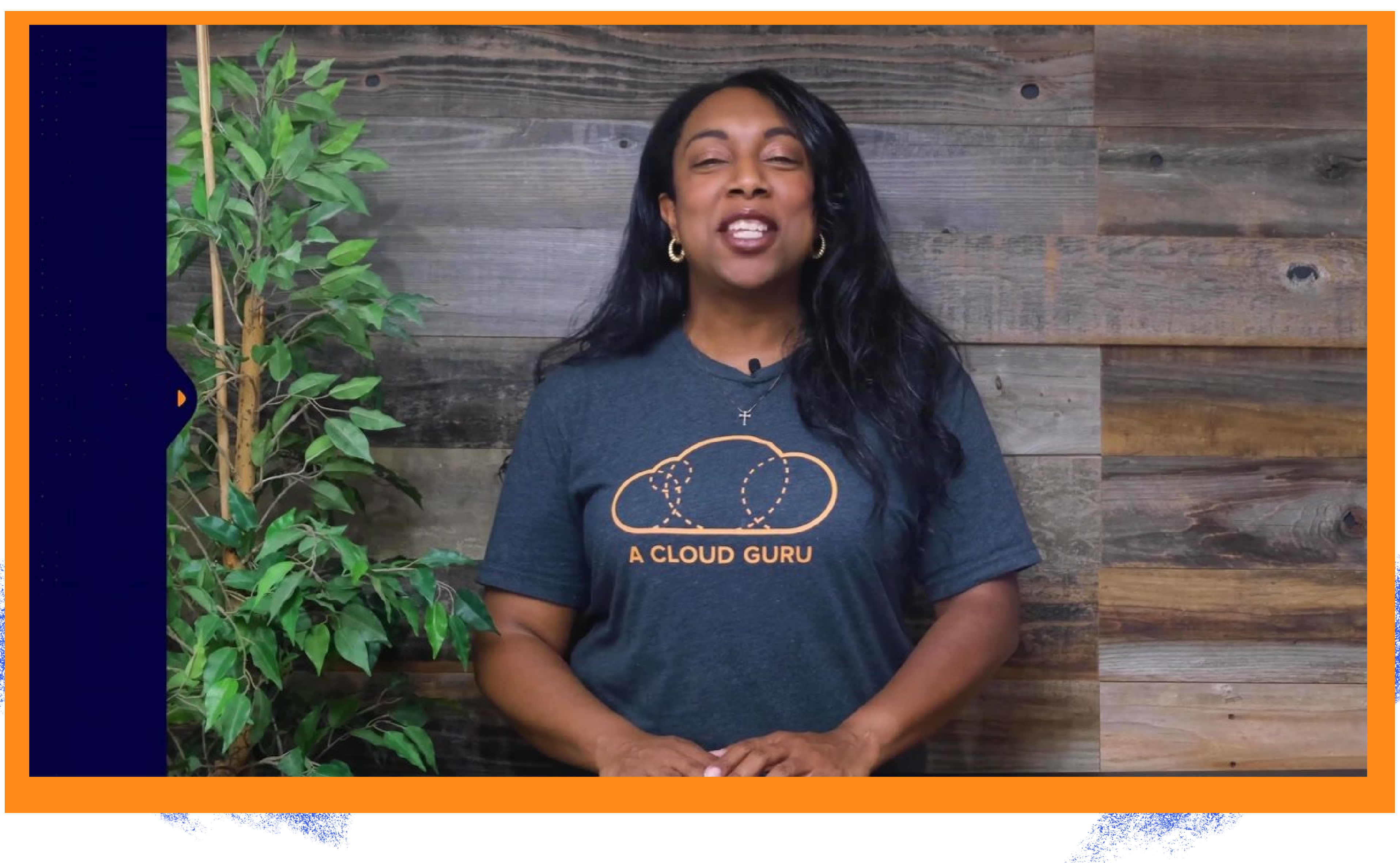
2 Case Study

GET STARTED

INTRODUCTION

Hello!

Welcome to the course.



This will be a fun journey!

Before starting this course

Make sure you have taken the **Introduction to AWS** course.

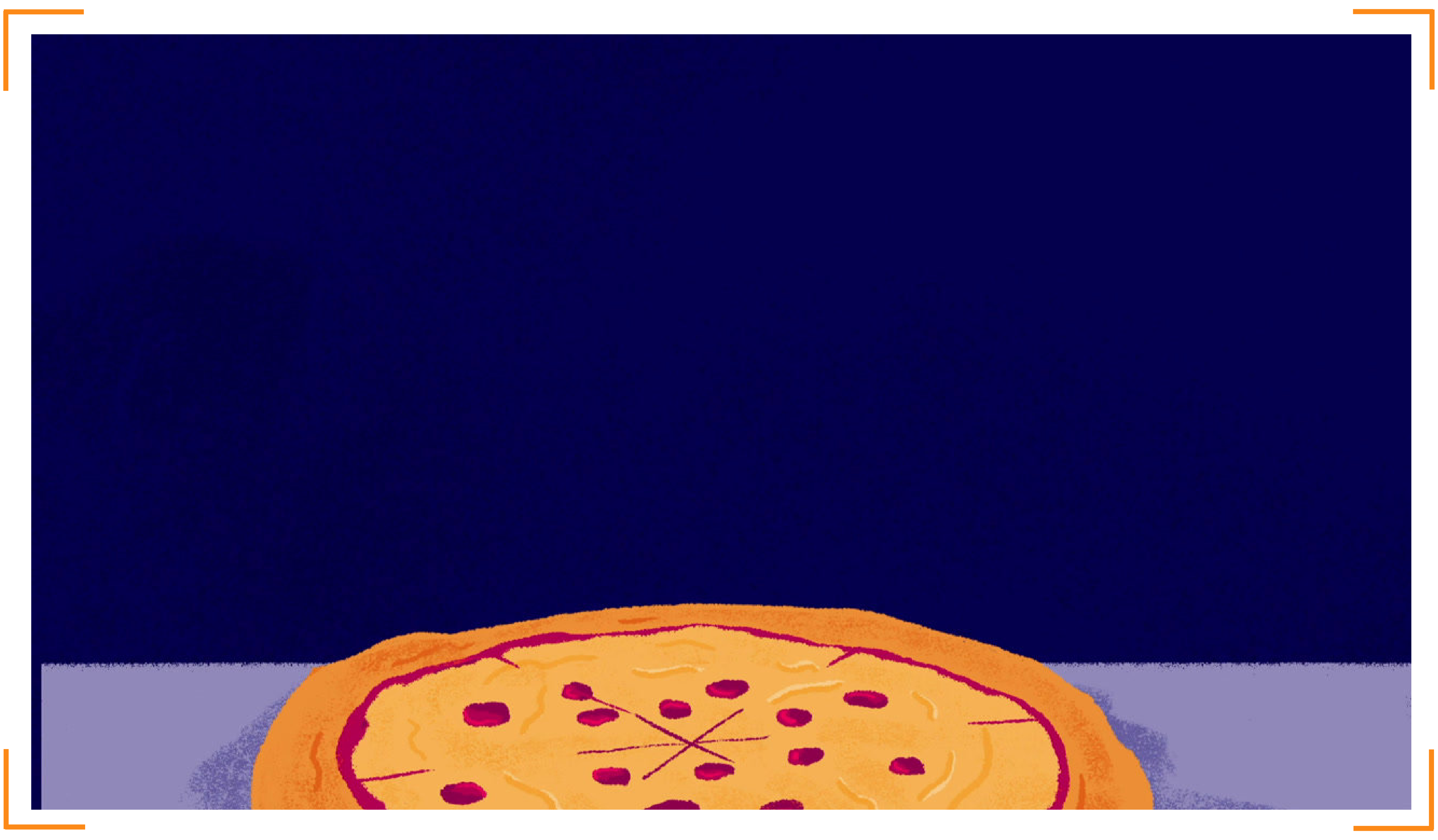
After we finish this journey together

You'll have a solid understanding of **cloud computing** and be ready for the **AWS Certified Cloud Practitioner** exam.

Case Study

Alfredo's Pizza

Alfredo's Pizza is the case study for our course.



A CLOUD GURU

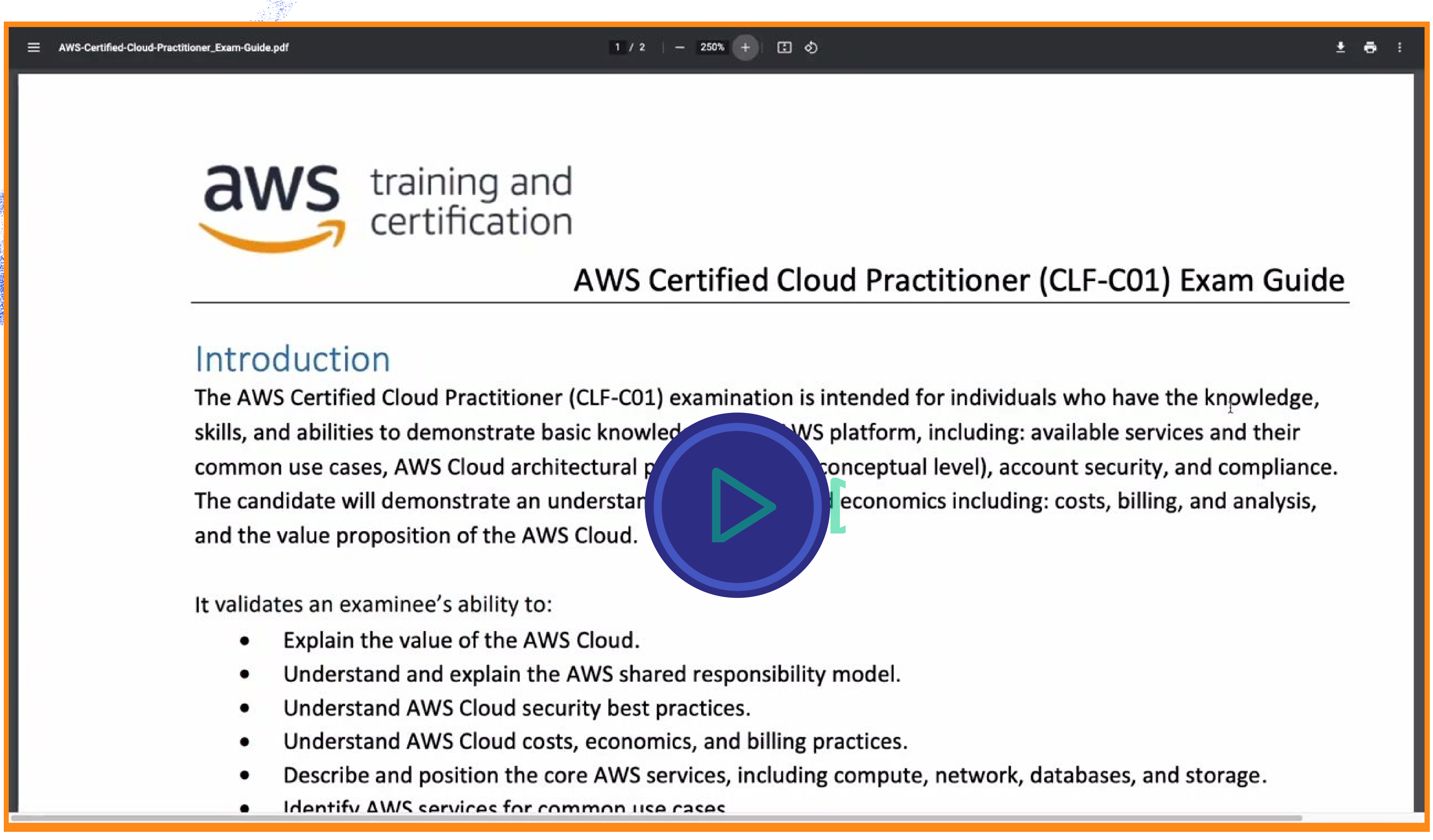
Exploring the Exam Blueprint

AWS CERTIFIED CLOUD PRACTITIONER

GET STARTED

Let's take a closer look!

We'll explore the exam blueprint in this lesson.



aws training and certification

AWS Certified Cloud Practitioner (CLF-C01) Exam Guide

Introduction

The AWS Certified Cloud Practitioner (CLF-C01) examination is intended for individuals who have the knowledge, skills, and abilities to demonstrate basic knowled WS platform, including: available services and their common use cases, AWS Cloud architectural p conceptual level), account security, and compliance. The candidate will demonstrate an understan economics including: costs, billing, and analysis, and the value proposition of the AWS Cloud.

It validates an examinee's ability to:

- Explain the value of the AWS Cloud.
- Understand and explain the AWS shared responsibility model.
- Understand AWS Cloud security best practices.
- Understand AWS Cloud costs, economics, and billing practices.
- Describe and position the core AWS services, including compute, network, databases, and storage.
- Identify AWS services for common use cases

READ EXAM BLUEPRINT:
https://d1.awsstatic.com/training-and-certification/docs-cloud-practitioner/AWS-Certified-Cloud-Practitioner_Exam-Guide.pdf

There are 4 exam domains

Cloud Concepts

Cloud Concepts covers the Amazon Web Services (AWS) cloud value proposition, cloud economics, and cloud architecture design principles.

26%

Technology

Technology covers methods of deployments and operations, global infrastructure, AWS services, and technology support.

33%

Security and Compliance

Security and Compliance defines the shared responsibility model, security and compliance concepts, and access management capabilities.

25%

Billing and Pricing

Billing and Pricing covers comparing pricing models, account structures, billing, pricing, and billing support resources.

16%

A CLOUD GURU

Understanding Cloud Computing

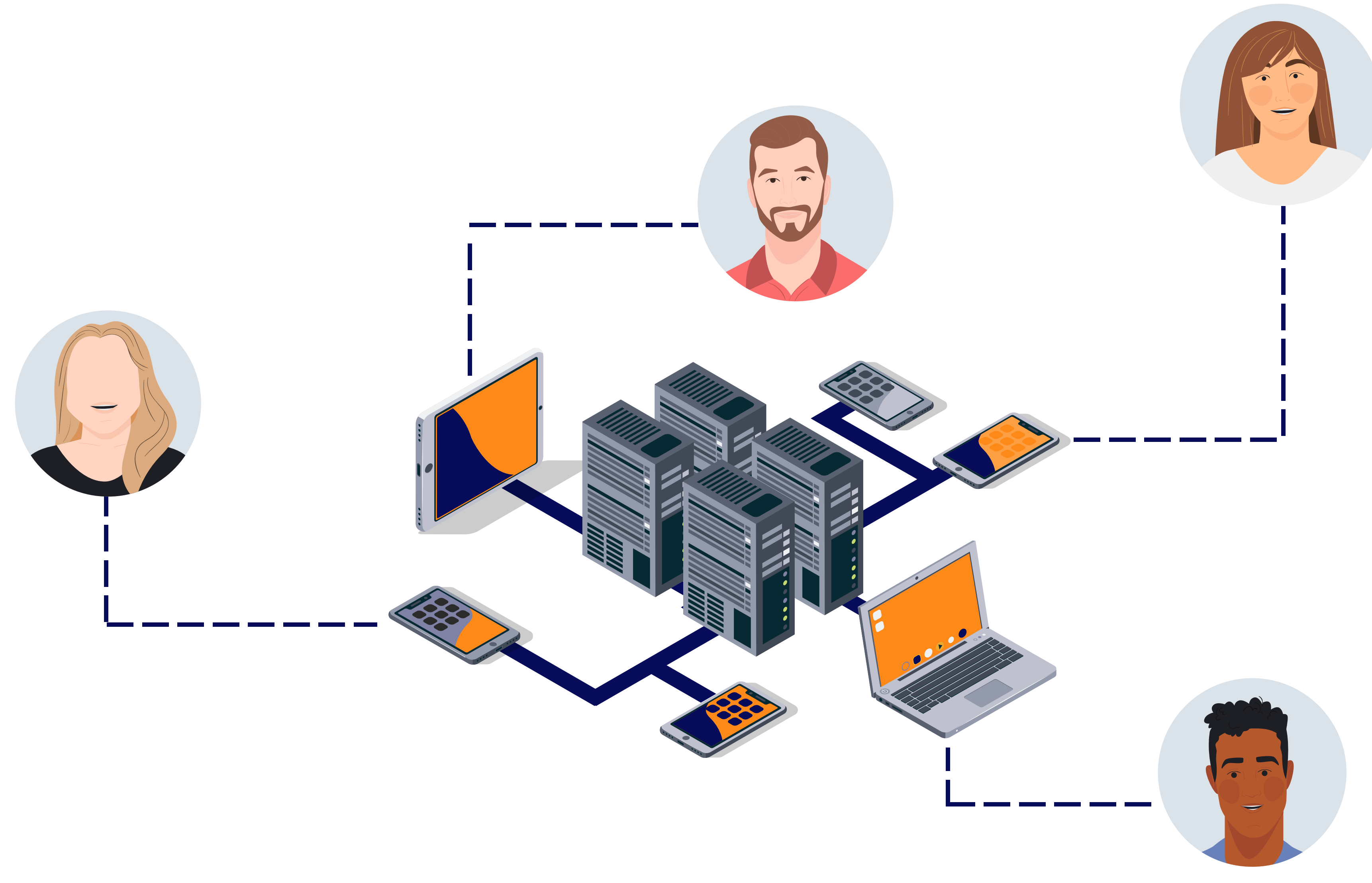
AWS CERTIFIED CLOUD PRACTITIONER

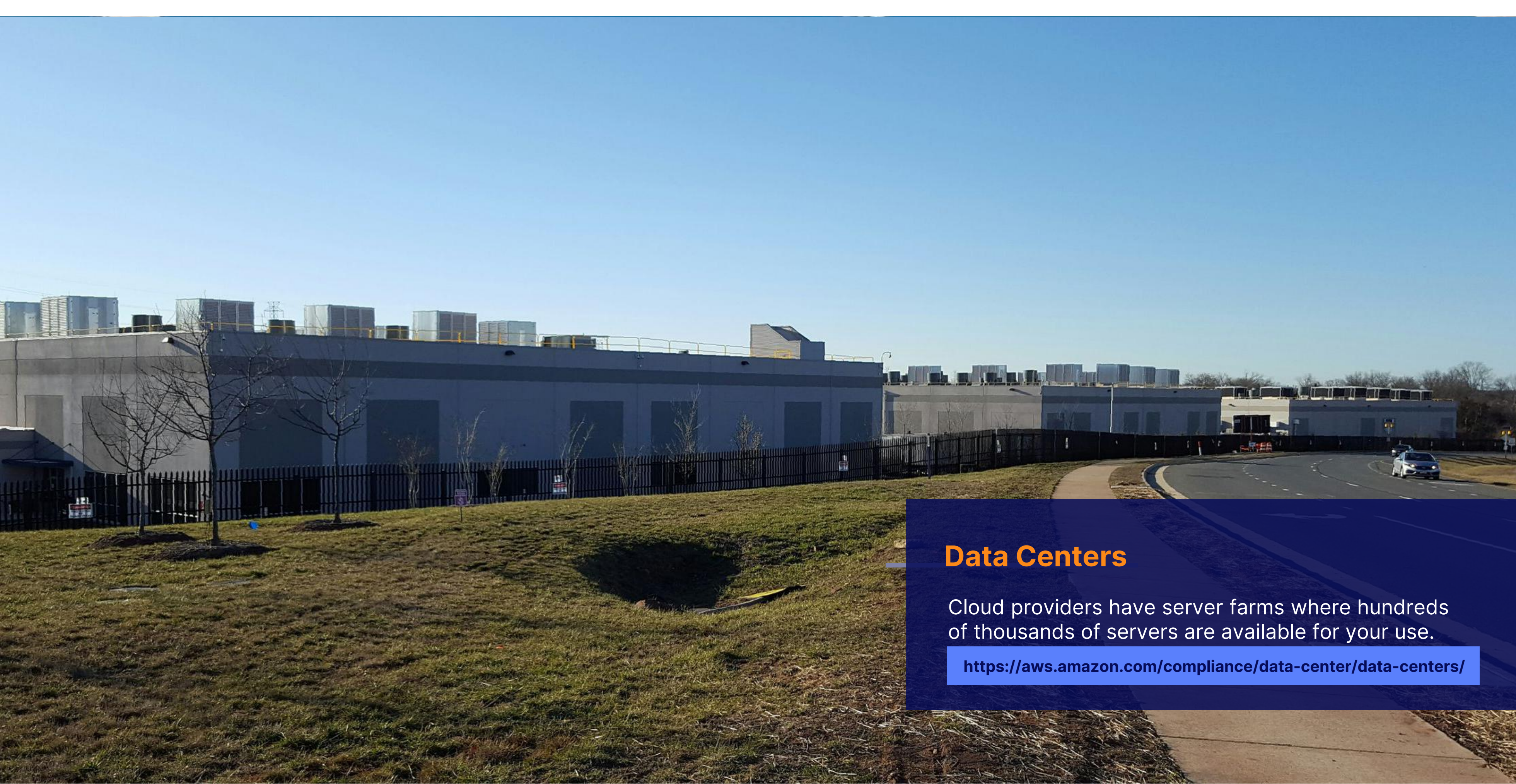
What do you think about when you hear the term **"the cloud"**?

"The cloud" is a real place; your data is stored somewhere.

Your data is in the cloud.
You should migrate to the cloud.
You can work in the cloud.

Servers are very powerful computers that handle your requests.





Data Centers

Cloud providers have server farms where hundreds of thousands of servers are available for your use.

https://aws.amazon.com/compliance/data-center/data-centers/

Let's take a closer look!

CLOUD COMPUTING OVERVIEW

What is cloud computing, exactly?

Cloud computing is the delivery of computing services over the internet.

Compute	EC2 Lambda	https://aws.amazon.com/products/compute/
Networking	VPC Direct Connect	https://aws.amazon.com/products/networking/
Storage	S3 EBS	https://aws.amazon.com/products/storage/
Analytics	Athena Redshift	https://aws.amazon.com/big-data/datalakes-and-analytics/
Development	Cloud9 CodeCommit	https://aws.amazon.com/products/developer-tools/
Security	IAM Macie	https://aws.amazon.com/products/security/
Databases	RDS DynamoDB	https://aws.amazon.com/products/databases/

WHITEPAPER

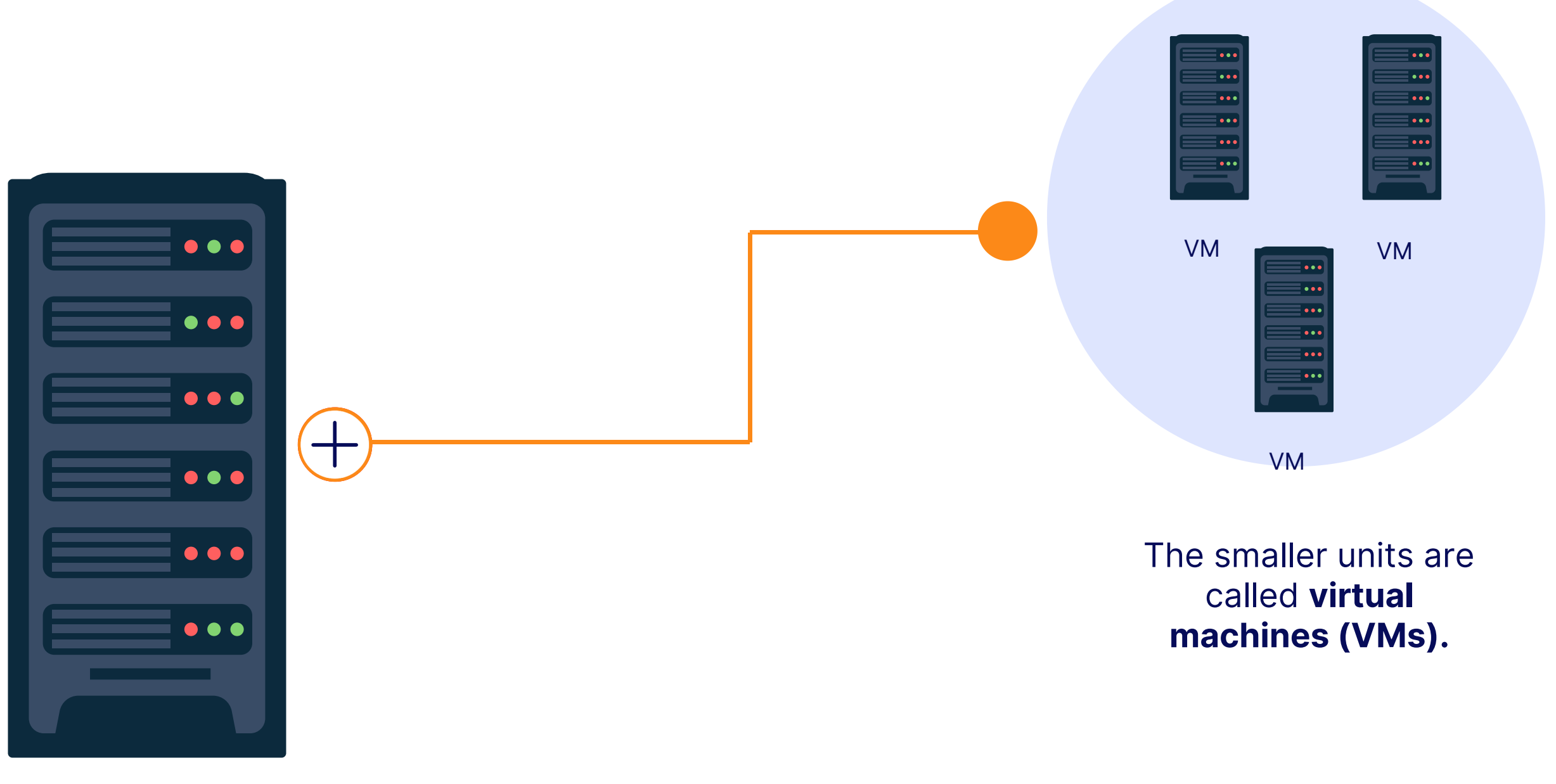
Title: Overview of Amazon Web Services **Tips:** Read in full before the exam. Review the day before the exam.

Topics: A full list of all the AWS services. You'll mainly focus on Compute, Serverless, Storage, Networking and Content Delivery, Database, Analytics, Security, Machine Learning, Cost Management, Migration and Transfer, and Management and Governance.

White Paper: https://docs.aws.amazon.com/whitepapers/latest/aws-overview/aws-overview.pdf

Virtual Machines

Virtualization lets you divide hardware resources on a single **physical** server into smaller units.



The smaller units are called **virtual machines (VMs).**

Virtualization is at the heart of cloud computing.

Usage

Your usage is placed on a meter.
You pay only when you access it and only for what you use.

1 On Demand — No long-term commitments or upfront payments

2 Pay as You Go — Pay by the hour or the second for only what you use

Things to Remember When Studying for the Exam

- ☑ **Learn the categories**
  Lambda and EC2 are compute services.
- ☑ **Read the whitepaper**
  Read the "Overview of Amazon Web Services" whitepaper, and review it again the day before your exam.

A CLOUD GURU

Exploring the Advantages of Cloud Computing

AWS CERTIFIED CLOUD PRACTITIONER

ADVANTAGES OF THE CLOUD

There are 6 advantages to cloud computing.

1 Go global in minutes

You can deploy your applications around the world at the click of a button.

2 Stop spending money running and maintaining data centers

You can focus on building your applications instead of managing hardware.

3 Benefit from massive economies of scale

Volume discounts are passed on to you, which provides lower pay-as-you-go prices.

4 Increase speed and agility

The provided services allow you to innovate more quickly and deliver your applications faster.

5 Stop guessing capacity

Your capacity is matched exactly to your demand.

6 Trade capital expense for variable expense

You pay for what you use instead of making huge upfront investments.

Alfredo's Pizza

Did you know there are many benefits of cloud computing?

1 High Availability

Highly available systems are designed to operate continuously without failure for a long time. These systems avoid loss of service by reducing or managing failures.

2 Elasticity

With elasticity, you don't have to plan ahead of time how much capacity you need. You can provision only what you need, and then grow and shrink based on demand.

3 Agility

The cloud gives you increased agility. All the services you have access to help you innovate faster, giving you speed to market.

4 Durability

Durability is all about long-term data protection. This means your data will remain intact without corruption.

ACG Blog

BLOG POST

Title: AWS Terminology Cheat Sheet **Time:** 7 minutes

Although this post was written in 2018, the terms are still 100% relevant. I hope it helps you as you learn the cloud.

https://acloudguru.com/blog/engineering/your-aws-terminology-cheat-sheet

Things to Remember When Studying for the Exam

☑ **Understand the 6 advantages**
Explain the 6 advantages and understand how the cloud saves you money.

☑ **Understand cloud terminology**
Explain high availability, elasticity, agility, and durability.

A CLOUD GURU

Reviewing Cloud Computing and Deployment Models

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Cloud Computing Models
2. Cloud Deployment Models
3. Review

GET STARTED

COMPUTING MODELS

Cloud Computing Models

There are 3 common cloud computing models.

1 Infrastructure as a Service (IaaS)

Building Blocks
Fundamental building blocks that can be rented.

Web Hosting
Monthly subscription to have a hosting company serve your website.

2 Software as a Service (SaaS)

Complete Application
Using a complete application, on demand, that someone offers to users.

Email Provider
Your personal email that you access through a web browser is SaaS.

3 Platform as a Service (PaaS)

Used by Developers
Develop software using web-based tools without worrying about the underlying infrastructure.

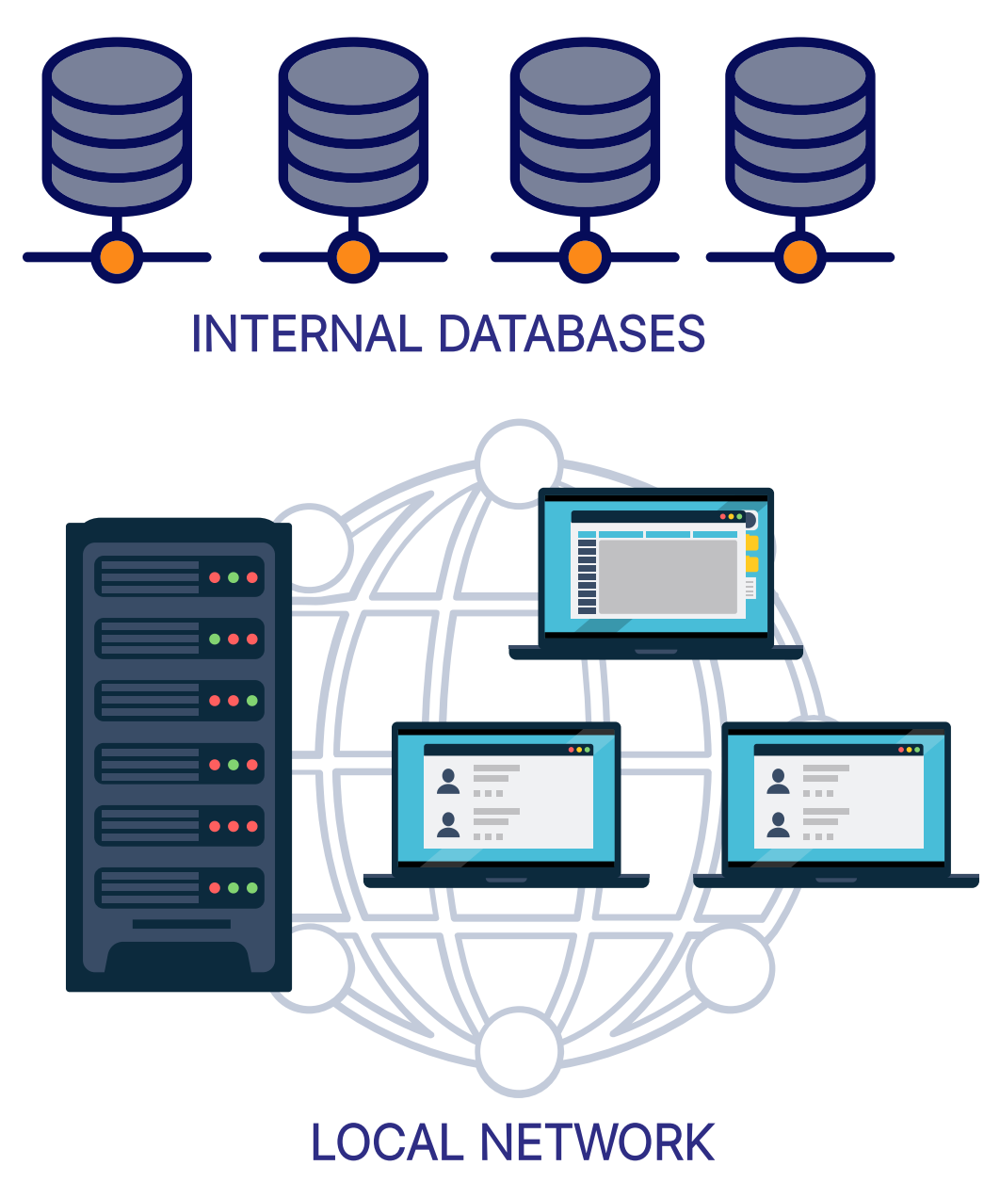
Storefront Website
Tools provided to build a storefront application that runs on another company's server.

DEPLOYMENT MODELS

Cloud Deployment Models

There are 3 common cloud deployment models.

1 Private Cloud



Key Takeaways:

1. Also called "on-premises"
2. Exists in your internal data center
3. Doesn't offer the advantages of cloud computing

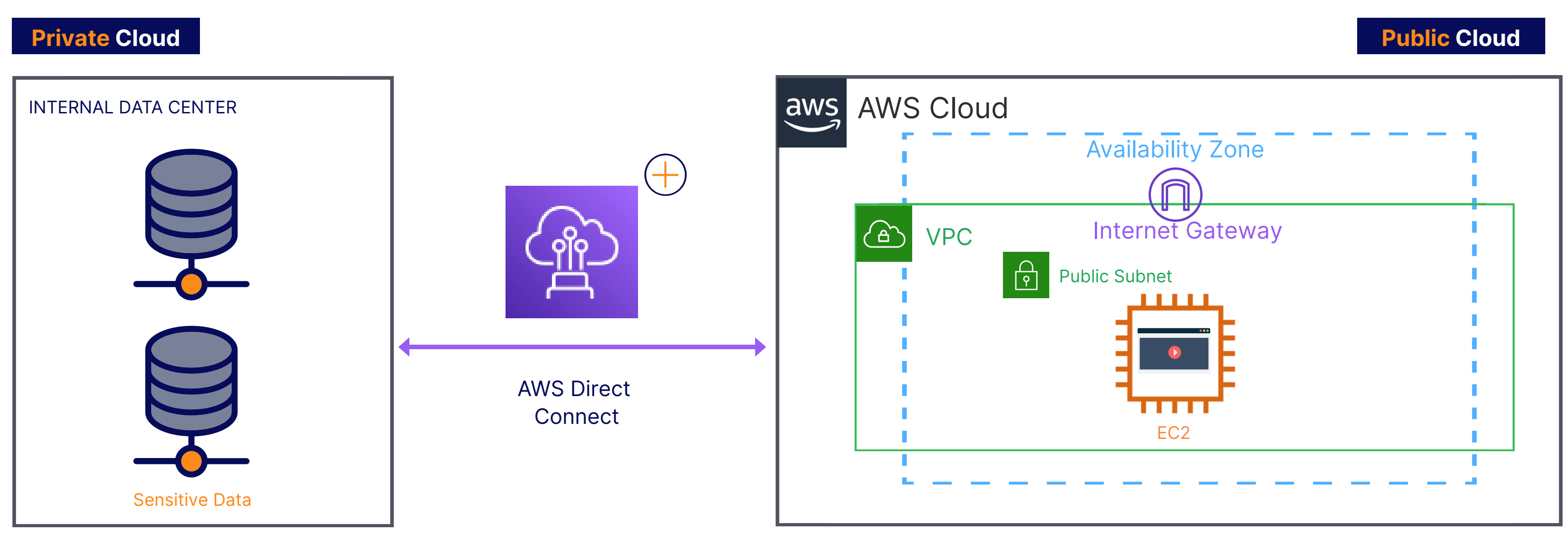
2 Public Cloud

Key Takeaways:

1. Offered by AWS
2. You aren't responsible for the physical hardware
3. Provides all the advantages of cloud computing

3 Hybrid Cloud

A hybrid cloud is a combination of public and private clouds.



Key Takeaways:

1. Sample architecture for a hybrid solution
2. Highly sensitive data stored locally
3. Web application runs on AWS infrastructure
4. AWS provides tools so they talk to each other

Review Time!

3 Models | Deployment

3 Models

1. **Infrastructure** as a Service (IaaS)
2. **Software** as a Service (SaaS)
3. **Platform** as a Service (PaaS)

Deployment

- ☑ **Private** Cloud
- ☑ **Public** Cloud
- ☑ **Hybrid** Cloud

Things to Remember When Studying for the Exam

☑ **Know the computing models**
Explain the 3 common cloud computing models.

☑ **Know the deployment models**
Explain the differences and understand that hybrid deployments are supported by Direct Connect.

A CLOUD GURU

Leveraging the AWS Global Infrastructure

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

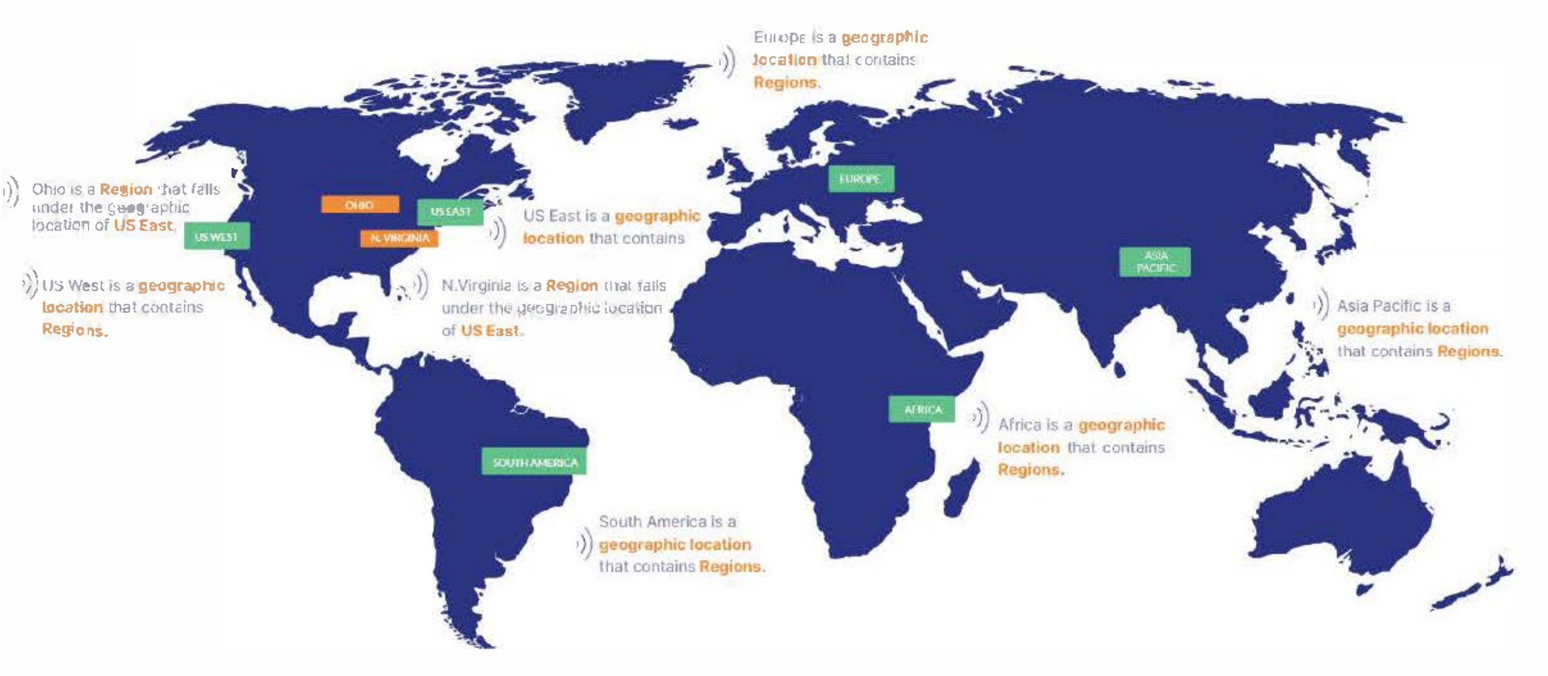
1. Regions
2. Availability Zones
3. Edge Locations
4. Review

GET STARTED

Alfredo's Pizza

Regions

A Region is a physical location.

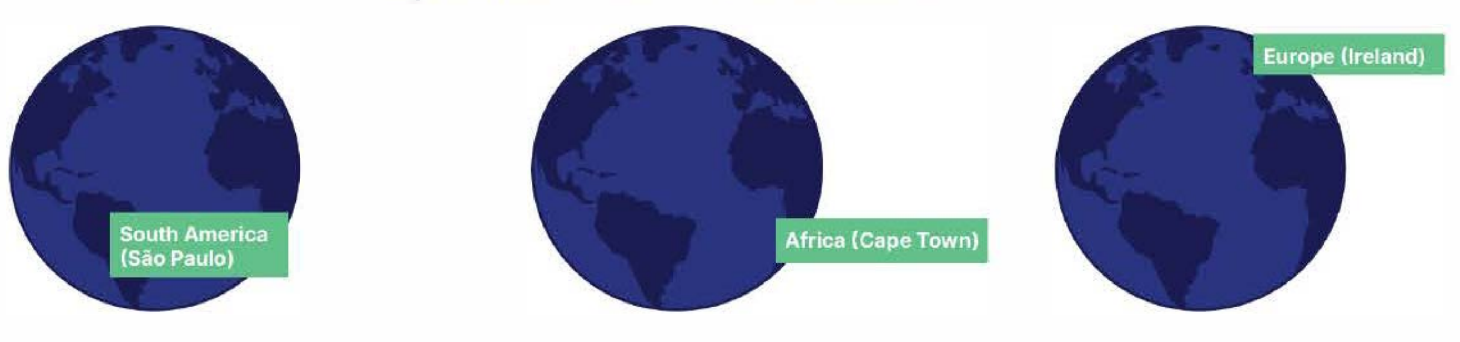

Europe is a **geographic location** that contains **Regions**.
Ohio is a **Region** that falls under the geographic location of **US East**.
OHIO
US EAST
US WEST
N. VIRGINIA
EUROPE
US East is a **geographic location** that contains
US West is a **geographic location** that contains **Regions**.
N.Virginia is a **Region** that falls under the geographic location of **US East**.
ASIA PACIFIC
Asia Pacific is a **geographic location** that contains **Regions**.
AFRICA
Africa is a **geographic location** that contains **Regions**.
SOUTH AMERICA
South America is a **geographic location** that contains **Regions**.

How does AWS group Regions?

AWS logically groups its Regions into **geographic locations**.

Region Characteristics

Regions have **several** characteristics.



Fully Independent and Isolated

If one Region is impacted, the others will not be.

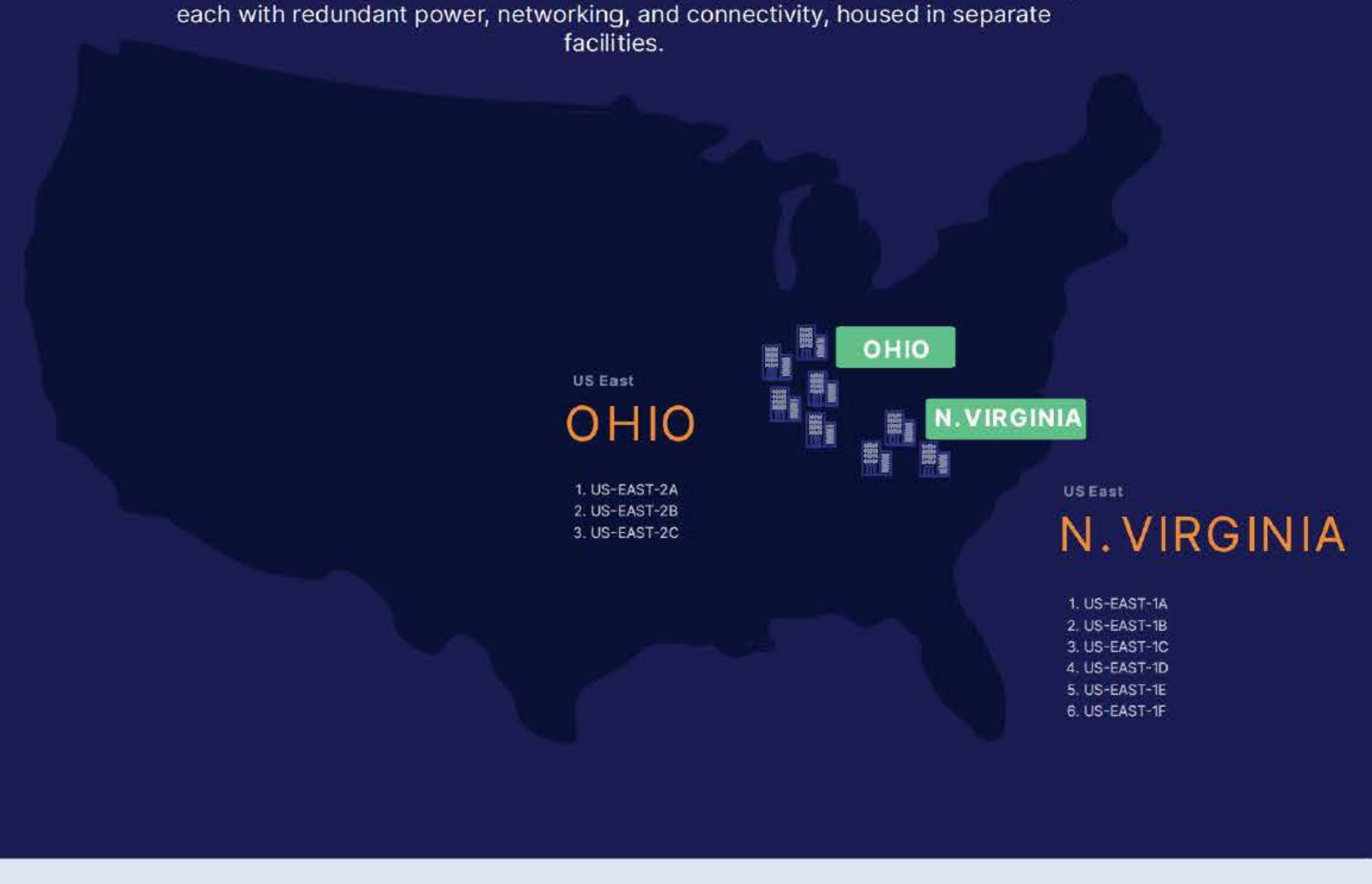
Resource and Service Specific

Regions are isolated, and resources aren't automatically replicated across them.

AVAILABILITY ZONES

Availability Zones

Availability Zones (AZs) consist of **one** or **more** physically separated **data centers**, each with redundant power, networking, and connectivity, housed in separate facilities.



US EAST

N. Virginia

US-EAST-1

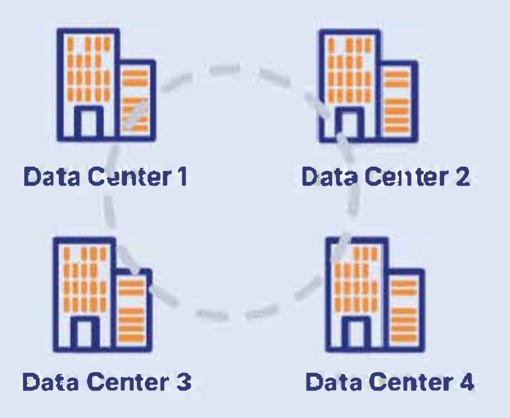
- US-EAST-1A
- US-EAST-1B
- US-EAST-1C
- US-EAST-1D
- US-EAST-1E
- US-EAST-1F

Availability Zone A

US-EAST-1A

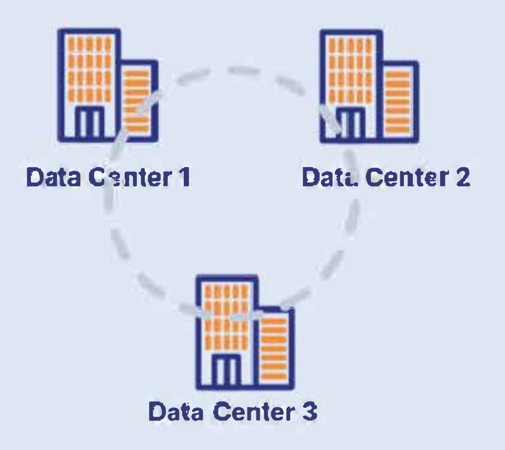
Availability Zone B

US-EAST-1B



Availability Zone C

US-EAST-1C

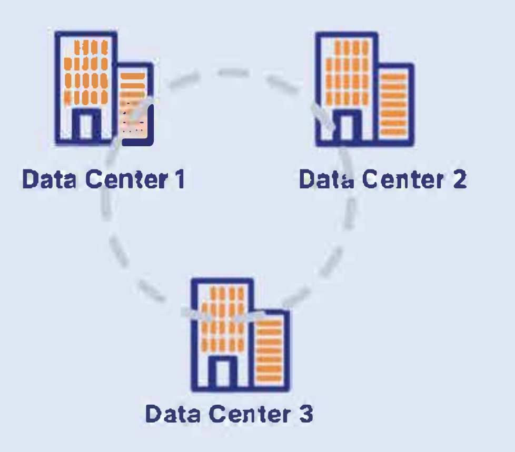


Availability Zone D

US-EAST-1D

Availability Zone E

US-EAST-1E



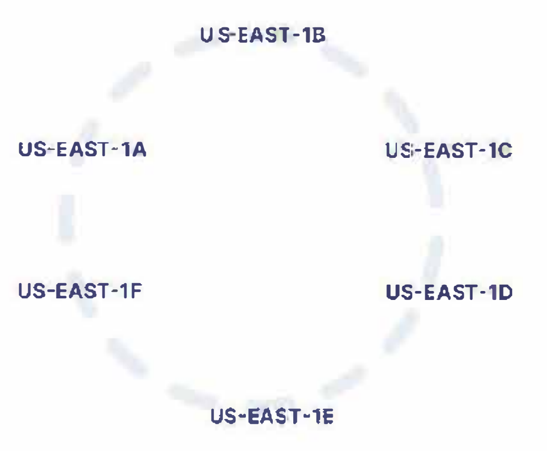
Availability Zone F

US-EAST-1F

Characteristics of AZs

Did you know AZs are connected among themselves in a single Region?

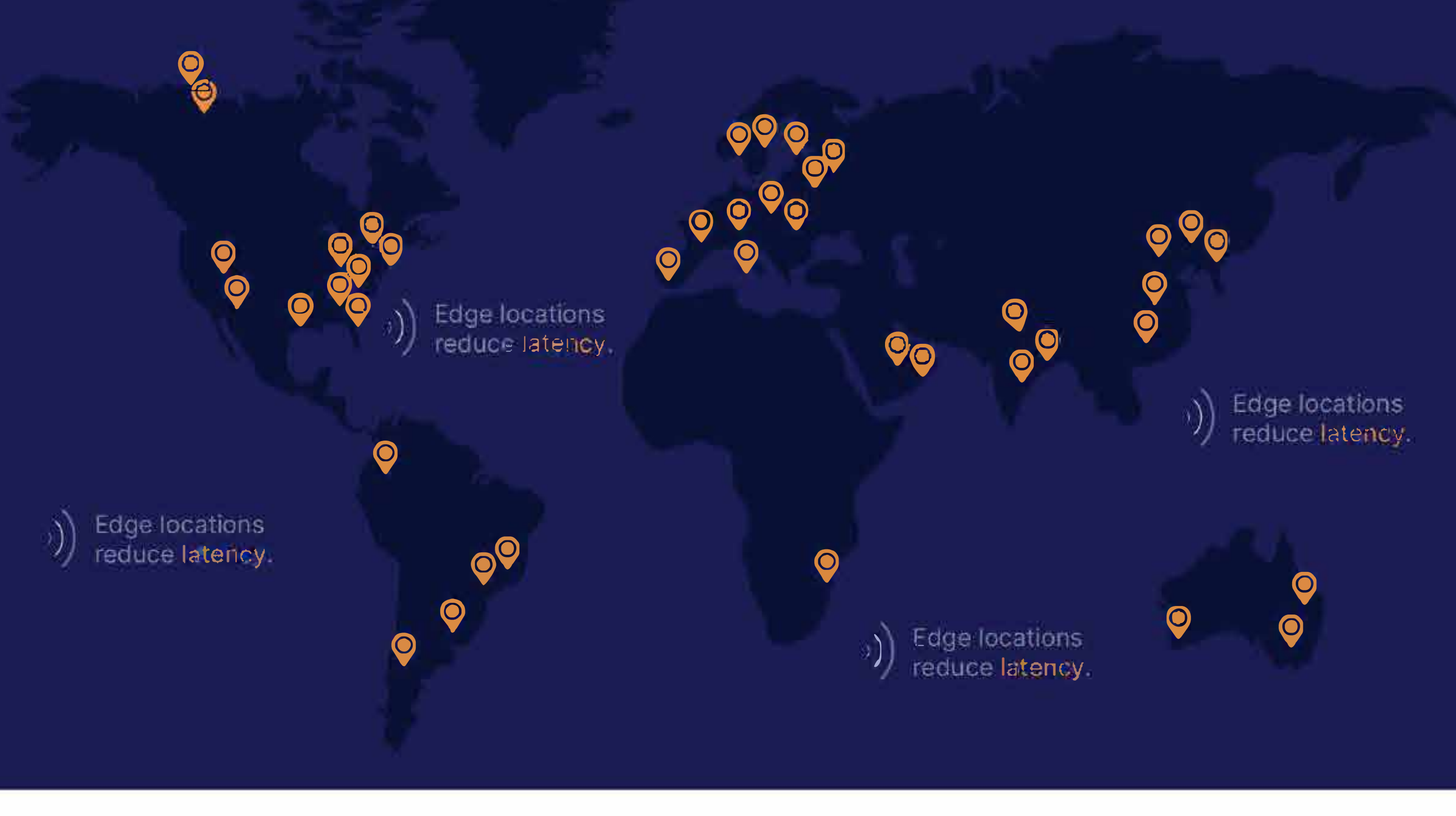
- Physically separated
- Connected through low-latency links
- Fault tolerant
- Allows for high availability



EDGE LOCATIONS

Edge Locations

Edge locations cache content for fast delivery to your users.


Edge locations reduce latency.
Edge locations reduce latency.
Edge locations reduce latency.
Edge locations reduce latency.

Latency

Latency is the **time** that passes between a user **request** and the resulting **response**.

Low Latency

Did you know **low** latency is better than **high** latency?

Review Time!

Region | Availability Zone | Edge Location

Region

A Region is a physical location in the world that contains AZs.

1. A Region is a collection of AZs.
2. You should set up resources in Regions closest to your users.
3. Most resources are tied to a specific Region.

Availability Zone

An AZ is a collection of one or more data centers.

- ☑ An AZ contains the servers you're renting, and it's where you deploy your applications.
- ☑ An AZ is associated with a single Region.

Edge Location

An edge location is used to cache content for speedy delivery.

1. Content delivery network (CDN) and Amazon CloudFront
2. Reduced latency
3. An edge location is like a mini data center, but it doesn't run your main infrastructure like EC2 instances.

Things to Remember When Studying for the Exam

- ☑ **Multi-AZ deployments provide high availability.** Systems that are highly available are dependable enough to operate continuously without failure.
- ☑ **An AZ has multiple data centers.** You can think of an AZ as a collection of data centers.
- ☑ **A Region is global and has 2 or more AZs.** Regions are geographically isolated locations around the globe.
- ☑ **Edge locations ensure low latency by placing content closer to users.** There are more edge locations than Regions and AZs.

A CLOUD GURU

Exploring Your Amazon Web Services (AWS) Account

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. AWS Management Console
2. Root User
3. AWS Command Line Interface (CLI)
4. Review

GET STARTED

AWS MANAGEMENT CONSOLE

The AWS Management Console

The **AWS Management Console** allows you to access your AWS account and manage applications running in your account from a **web browser**.

The Console

The console makes it easy to search for and find services.

The console has broad usage.

1 New to Cloud

If you're just getting started with the cloud.

2 Non-Technical Roles

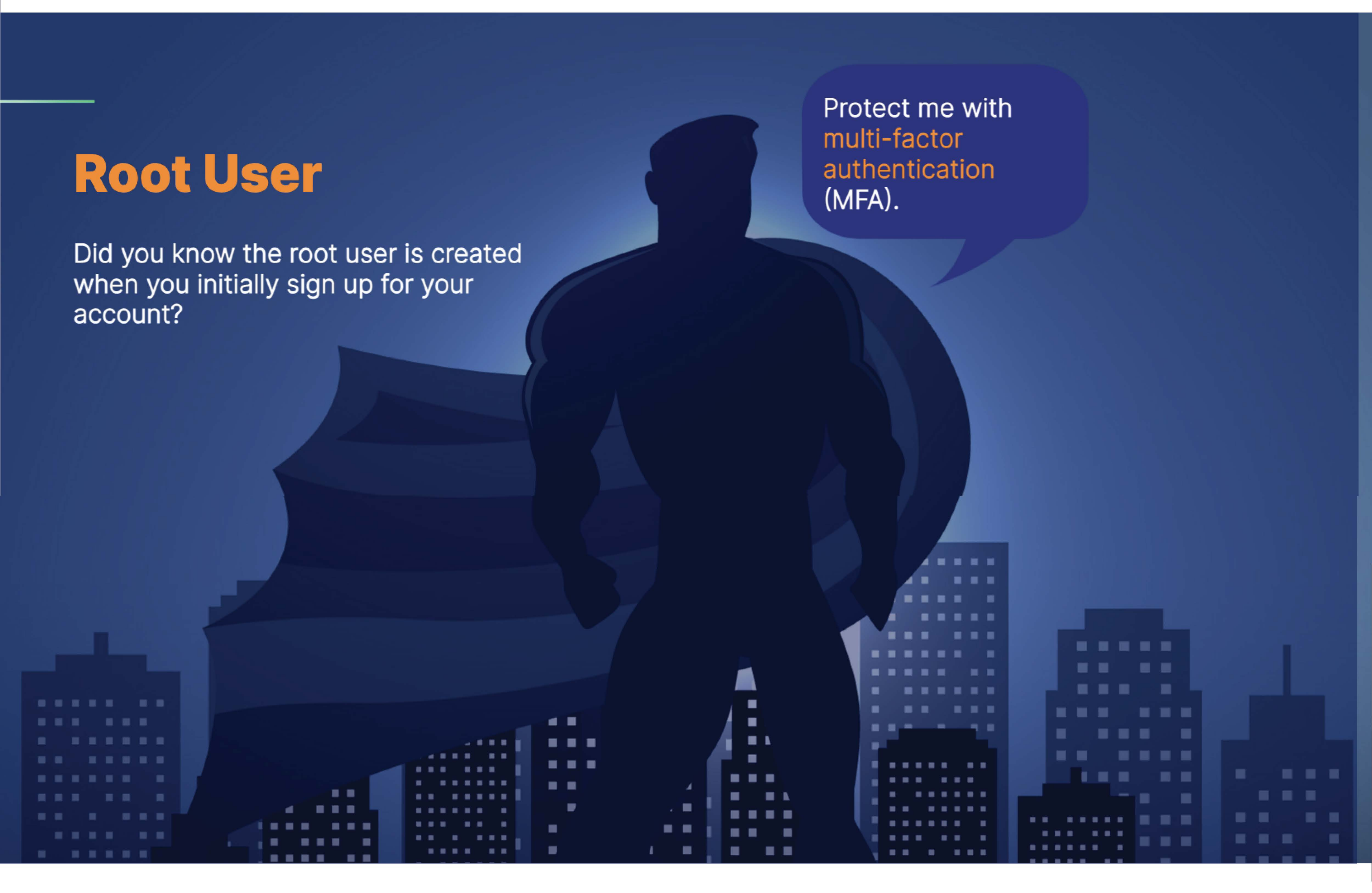
If you serve in a non-technical role: business analyst, project manager, and many more.

3 Technical Roles

If you serve in a technical role: software engineer, web developer, solutions architect, and many more.

Root User

Did you know the root user is created when you initially sign up for your account?


Protect me with multi-factor authentication (MFA).

COMMAND LINE INTERFACE

AWS Command Line Interface (CLI)

The **AWS Command Line Interface (CLI)** allows you to access your AWS account through a **terminal** or **command** window.

The CLI

Sometimes new features are available via the CLI **before** the console.

The CLI is mainly used by developers.

Programmatic Access

Programmatic access provides access to your AWS resources through an application or a tool like the CLI.

1 Command Line Interface

The CLI allows you to manage AWS services from a terminal session on your laptop.

2 Application Code

AWS services can be accessed from application code using SDKs and programmatic calls.

3 Software Development Kits (SDKs)

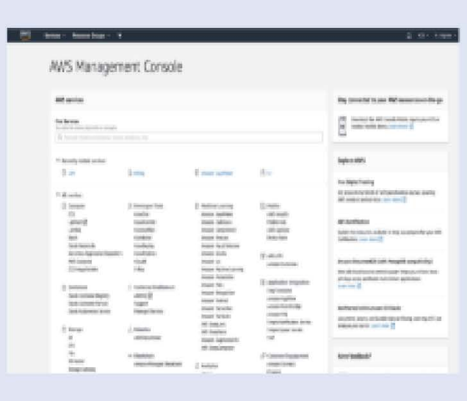
SDKs allow you to access AWS services from popular programming languages like Java, Python, C#, and many more.

Review Time!

Root User | The Console | The CLI

Root User

The root user is automatically created when you open your account.



The Console

The console allows access via a web browser.

The CLI

The CLI is a form of programmatic access from a command or terminal window.

Things to Remember When Studying for the Exam

☑ **Protect the root user**

The root user should be protected with MFA.

☑ **The power of the root user**

There are certain things that only the root user can do.

☑ **The CLI**

Understand what's stored on your local machine to access AWS via the CLI.

A CLOUD GURU

Technology Section Introduction

AWS CERTIFIED CLOUD PRACTITIONER

GET STARTED

168 AWS Services in 2 minutes
Watch later
Share
168 AWS SERVICES IN 2 MINS
CLICK HERE TO WATCH VIDEO

Services

We have a lot of services to cover in this section!

> You may feel like Forrest after this is over — out of breath — but hang in there with me!

Let's take a closer look!

Let's review the services we'll cover in this section.

Here you'll also be able to link directly to each lesson.

Compute

EC2
EC2 allows you to rent and manage virtual servers in the cloud.

Lambda
Lambda is a serverless compute service that lets you run code without managing servers.

Fargate
Fargate is a serverless compute engine for containers.

Lightsail
Lightsail allows you to quickly launch all the resources you need for small projects.

Outposts
Outposts allows you to run cloud services in your internal data center.

Batch
Batch allows you to process large workloads in smaller chunks (or batches).

Storage

S3
S3 is an object storage service for the cloud that is highly available.

EBS
EBS is a storage device (called a volume) that can be attached to (or removed from) your instance.

EFS
EFS is a serverless network file system for sharing files.

Storage Gateway
Storage Gateway is a hybrid storage service.

Content Delivery

CloudFront
CloudFront is a CDN that delivers data and applications globally with low latency.

Global Accelerator
Global Accelerator sends your users through the AWS global network when accessing your content, speeding up delivery.

S3 Transfer Acceleration
S3 Transfer Acceleration improves content uploads and downloads to and from S3 buckets.

Networking

Route 53
Route 53 is a DNS service that routes users to applications.

Virtual Private Cloud (VPC)
VPC is a foundational service that allows you to create a secure private network in the AWS Cloud where you launch your resources.

Direct Connect
Direct Connect is a dedicated physical network connection from your on-premises data center to AWS.

Virtual Private Network (VPN)
Site-to-Site VPN creates a secure connection between your internal networks and your AWS VPCs.

Databases

Relational Database Service (RDS)
RDS is a service that makes it easy to launch and manage relational databases.

Aurora
Aurora is a relational database compatible with MySQL and PostgreSQL that was created by AWS.

DynamoDB
DynamoDB is a fully managed NoSQL key-value and document database.

DocumentDB
DocumentDB is a fully managed document database that supports MongoDB.

ElastiCache
ElastiCache is a fully managed in-memory datastore compatible with Redis or Memcached.

Neptune
Neptune is a fully managed graph database that supports highly connected datasets.

Migration and Transfer

Database Migration Service (DMS)
DMS helps you migrate databases to or within AWS.

Server Migration Service (SMS)
SMS allows you to migrate on-premises servers to AWS.

Snow Family
The Snow Family allows you to transfer large amounts of on-premises data to AWS using a physical device.

DataSync
DataSync allows for online data transfer from on-premises to AWS storage services like S3 or EFS.

Analytics

Redshift
Redshift is a scalable data warehouse solution.

Athena
Athena is a query service for Amazon S3.

Glue
Glue prepares your data for analytics.

Kinesis
Kinesis allows you to analyze data and video streams in real time.

Elastic MapReduce (EMR)
EMR helps you process large amounts of data.

Data Pipeline
Data Pipeline helps you move data between compute and storage services running either on AWS or on-premises.

Machine Learning

Rekognition
Rekognition allows you to automate your image and video analysis.

Comprehend
Comprehend is a natural-language processing (NLP) service that finds relationships in text.

Polly
Polly turns text into speech.

SageMaker
SageMaker helps you build, train, and deploy machine learning models quickly.

Translate
Translate provides language translation.

Lex
Lex helps you build conversational interfaces like chatbots.

Developer Tools

Cloud9
Cloud9 allows you to write code within an integrated development environment (IDE) from within your web browser.

CodeCommit
CodeCommit is a source control system for private Git repositories.

CodeBuild
CodeBuild allows you to build and test your application source code.

CodeDeploy
CodeDeploy manages the deployment of code to compute services in the cloud or on-premises.

CodePipeline
CodePipeline automates the software release process.

X-Ray
X-Ray helps you debug production applications.

Deployment and Infrastructure Management

CloudFormation
CloudFormation allows you to provision AWS resources using Infrastructure as Code (IaC).

Elastic Beanstalk
Elastic Beanstalk allows you to deploy your web applications and web services to AWS.

OpsWorks
OpsWorks allows you to use Chef or Puppet to automate the configuration of your servers and deploy code.

Messaging and Integration

Simple Queue Service (SQS)
SQS is a message queuing service that allows you to build loosely coupled systems.

Simple Notification Service (SNS)
SNS allows you to send emails and text messages from your applications.

Simple Email Service (SES)
SES is an email service that allows you to send richly formatted HTML emails from your applications.

Auditing, Monitoring, and Logging

CloudWatch
CloudWatch is a collection of services that help you monitor and observe your cloud resources.

CloudTrail
CloudTrail tracks user activity and API calls within your account.

A CLOUD GURU

Exploring Compute Services: EC2

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Elastic Compute Cloud (EC2)
2. Use Cases
3. Connectivity
4. Pricing Options
5. Review

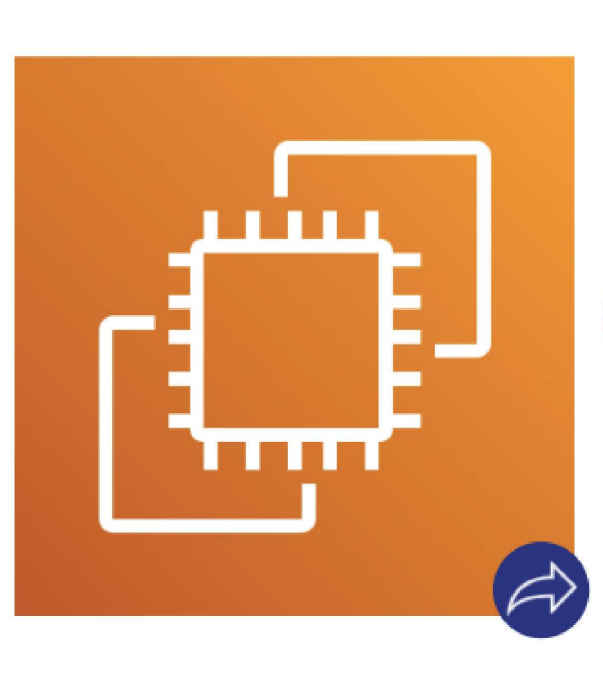
GET STARTED

EC2

Elastic Compute Cloud (EC2)

EC2 allows you to rent and manage virtual servers in the cloud.

Elastic compute power



Virtual servers in the cloud

BIGGER PICTURE

The Bigger Picture

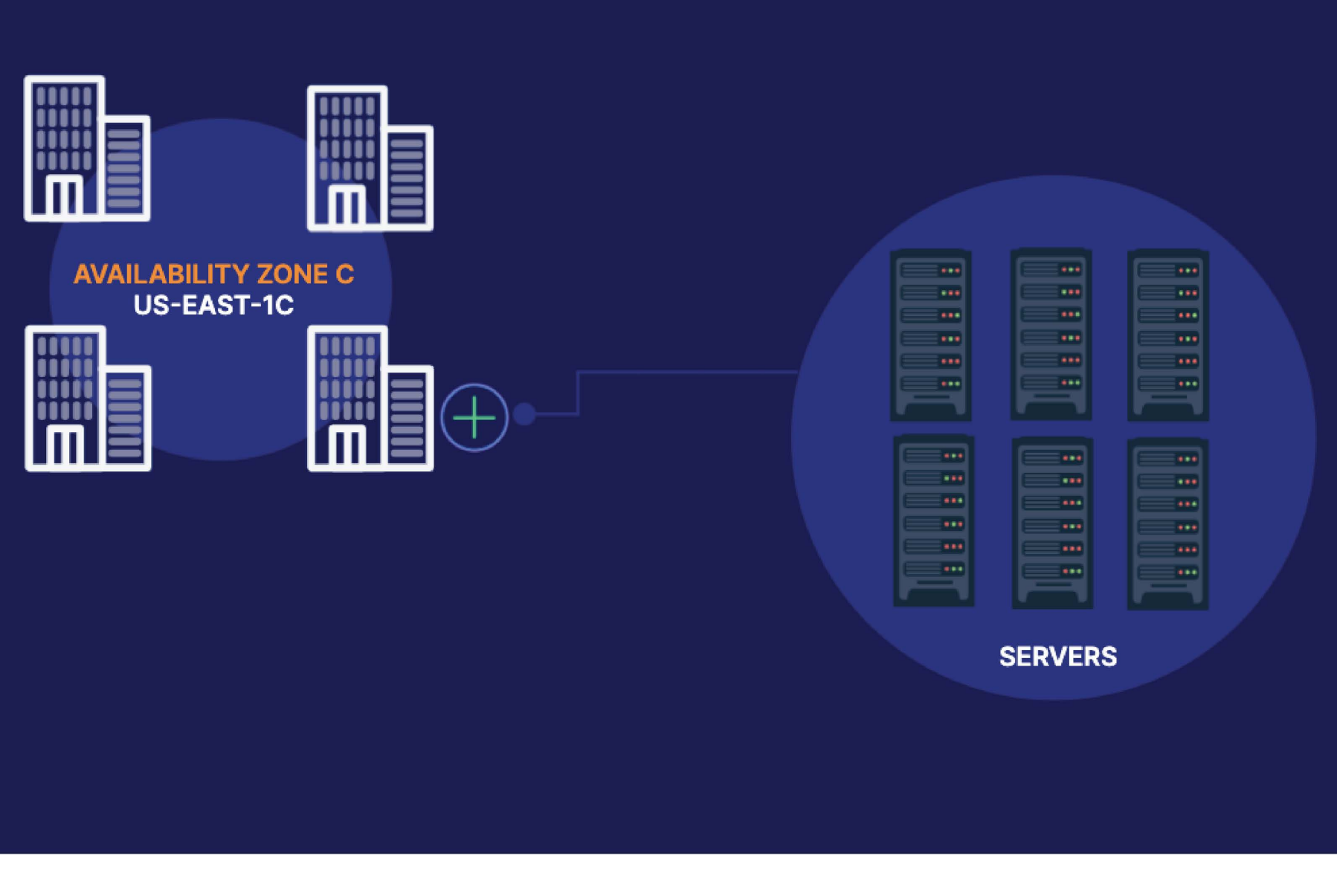
Let's discuss how **Amazon EC2** fits into the bigger picture.

N. Virginia is a Region that falls under the geographic location of US EAST.

1 Region
A single Region contains multiple AZs.

2 AZ
A single AZ contains multiple data centers.

3 Data center
A single data center contains multiple servers.



Servers are the physical compute hardware running in a data center.

EC2 **instances** are the virtual servers running on these physical servers.

Instances are **not** considered **serverless**.

Let's take a closer look

EC2 is a foundational service used for managing your virtual instances.

1. You're able to provision an EC2 instance at the click of a button.
2. You can use a preconfigured template called an Amazon Machine Learning (AMI), to launch you instance.
3. You can deploy your applications directly to EC2 instances.
4. You receive 750 compute hours per month on the Free Tier plan.

USE CASES

EC2 in the Real World

Let's discuss when you would use **EC2** in the real world.

1. **Deploy a database** — Deploying a database to EC2 gives you full control over the database.
2. **Deploy a web application** — Deploy to multiple AZs to make the web application highly available.

CONNECTIVITY

Methods to Access an EC2 Instance

There are several ways to access your EC2 instances.

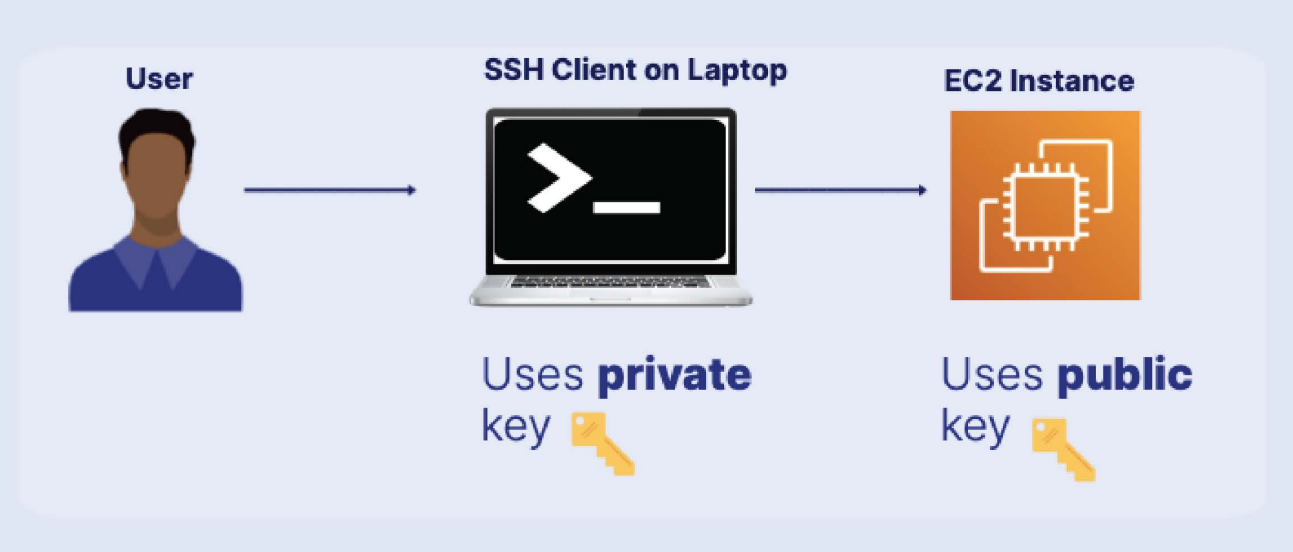
- ☑ **AWS Management Console**
  You're able to configure and manage your instances via a web browser.
- ☑ **Secure Shell (SSH)**
  SSH allows you to establish a secure connection to your instance from your local laptop.
- ☑ **EC2 Instance Connect (EIC)**
  EIC allows you to use IAM policies to control SSH access to your instances, removing the need to manage SSH keys.
- ☑ **AWS Systems Manager**
  Systems Manager allows you to manage your EC2 instances via a web browser or the AWS CLI.

The most common way to connect to Linux **EC2** instances is via **Secure Shell (SSH)**.

1 Generate a key pair

A **key pair**, which consists of a **private key** and a **public key**, proves your identity when connecting to an EC2 instance.

2 Connect via SSH



PRICING

EC2 Pricing Options

There are several pricing options to choose from for your **EC2** instances.

On-Demand

- ☑ A fixed price in which you are billed **down to the second** based on the instance type. There is no contract, and you pay only for what you use.
- ☑ **Use On-Demand instances when:**
  1. You care about low cost without any upfront payment or long-term commitment.
  2. Your applications have unpredictable workloads that **can't** be interrupted.
  3. Your applications are under development.
  4. Your workloads will **not** run longer than a year.
- ☑ **Fun facts:**
  You can **reserve capacity** using On-Demand Capacity Reservations. The EC2 capacity is held for you whether or not you run the instance.

Spot

Cheapest Option

- ☑ Spot instances let you take advantage of **unused** EC2 capacity. Your request is fulfilled **only** if capacity is available.
- ☑ **Use Spot instances when:**
  1. You are not concerned about the **start** or **stop** time of your application.
  2. Your workloads **can** be interrupted.
  3. Your application is only feasible at very low compute prices.
- ☑ **Fun facts:**
  1. You can save up to **90%** off On-Demand prices.
  2. You pay the spot price that's in effect at the beginning of each hour.

Reserved Instances (RIs)

- ☑ **RIs** allow you to commit to a specific instance type in a particular Region for **1** or **3** years.
- ☑ **Use Reserved Instances when:**
  1. Your application has **steady state usage**, and you can commit to **1** or **3** years.
  2. You can pay money **upfront** in order to receive a discount on On-Demand prices.
  3. Your application requires a **capacity reservation**.
- ☑ **Fun facts:**
  1. You can save up to **75%** off On-Demand prices.
  2. You are required to sign a contract.
  3. You can **reserve capacity** in an **Availability Zone** for any duration.
  4. You can pay **All Upfront, Partial Upfront**, or **No Upfront**. **All Upfront** for the max term earns the highest discount.
  5. Provides **convertible types** at **54%** discount.

Dedicated Hosts

- ☑ **Dedicated Hosts** allow you to pay for a physical server that is fully dedicated to running your instances.
- ☑ **Use Dedicated Hosts when:**
  1. You want to **bring your own** server-bound software **license** from vendors like Microsoft or Oracle.
  2. You have regulatory or corporate compliance requirements around tenancy model.
- ☑ **Fun facts:**
  1. You can save up to **70%** off On-Demand prices.
  2. You bring your existing **per-socket**, **per-core**, or **per-VM** software licenses.
  3. There is no multi-tenancy, meaning the server is not shared with other customers.
  4. A Dedicated Host is a physical server, whereas a Dedicated Instance runs on the host.

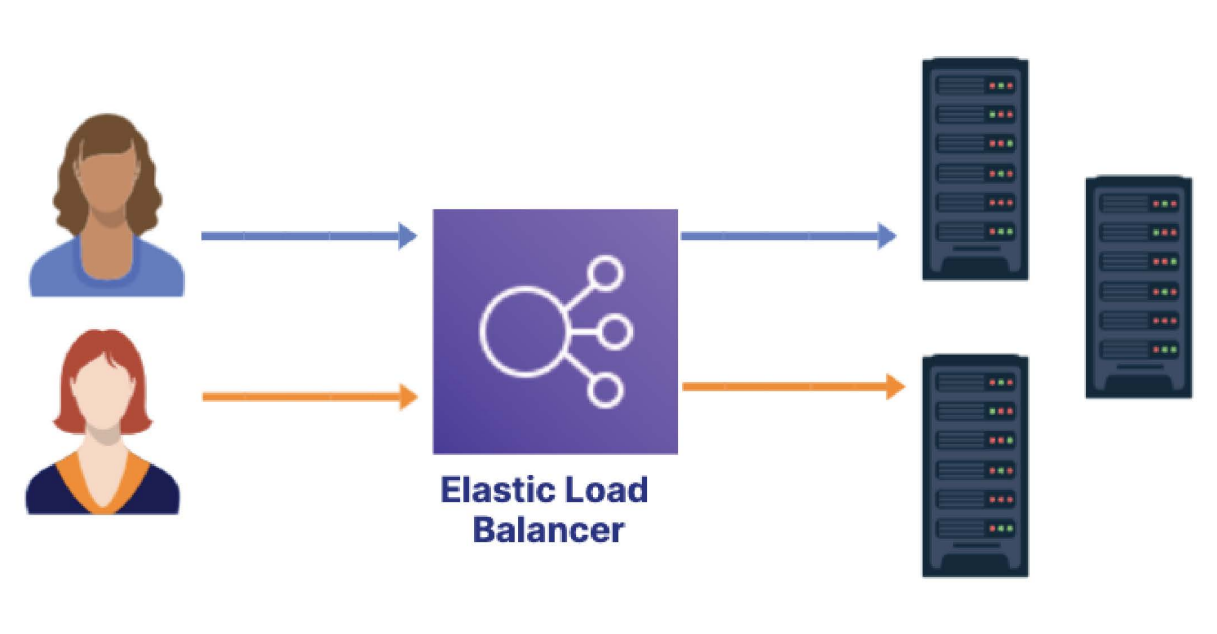
Savings Plan

- ☑ **Savings Plan** allows you to commit to compute usage (measured per hour) for **1** or **3** years.
- ☑ **Use Savings Plans when:**
  1. You want to lower your bill across multiple compute services.
  2. You want the flexibility to change compute services, instance types, operating sytems, or Regions.
- ☑ **Fun facts:**
  1. You can save up to **72%** off On-Demand prices.
  2. You are not making a commitment to a Dedicated Host, just compute usage.
  3. Savings can be shared across various compute services like EC2, Fargate, and Lambda.
  4. This does **not** provide a capacity reservation.

Features

EC2 instances offer load balancing and Auto Scaling.

1. **Elastic Load Balancing** automatically distributes your **incoming application traffic** across multiple EC2 instances.



CLASSIC LOAD BALANCERS | APPLICATION LOAD BALANCERS | GATEWAY LOAD BALANCERS | NETWORK LOAD BALANCERS

2. **EC2 Auto Scaling** adds or replaces EC2 instances automatically across AZs, **based on need and changing demand**.

HORIZONTAL SCALING OR SCALING OUT

Auto Scaling reduces the impact of system failures and improves the availability of your applications.

⚠ Do **not** confuse horizontal scaling with vertical scaling (or **scaling up**), which **upgrades** an EC2 instance by adding more power (CPU, RAM) to an **existing server**.

Review Time!

EC2 Instance | Connectivity | Pricing Options | Features

EC2 Instance

EC2 allows you to rent and manage virtual servers in the cloud. AWS virtual servers are called **instances**.

Connectivity

There are multiple ways to log in to your EC2 instance.

- ☑ **AWS** Management Console
- ☑ Secure Shell **(SSH)**
- ☑ **EC2** Instance Connect
- ☑ **AWS** Systems Manager

Pricing Options

1. On-Demand
2. Spot
3. Reserved Instances
4. Dedicated Hosts
5. Savings Plans

Features

1. Elastic Load Balancing
   Elastic Load Balancing automatically distributes your incoming application traffic across multiple EC2 instances.
2. EC2 Auto Scaling
   EC2 Auto Scaling adds or replaces EC2 instances automatically across AZs, based on need and changing demand.

Things to Remember When Studying for the Exam

- ☑ **EC2 pricing options**
  Understand On-Demand, Spot, Reserved Instances, Dedicated Hosts, and Savings Plans.
- ☑ **Horizontal scaling vs. vertical scaling**
  Horizontal scaling (or scaling out) adds or replaces instances, while vertical scaling (or scaling up) upgrades an existing instance.
- ☑ **Know the types of load balancers**
  Classic, Application, Gateway, and Network
- ☑ **Understand the benefits of Auto Scaling**
  Remember Auto Scaling improves the availability of your applications, and don't confuse it with load balancing.
- ☑ **Understand real-world usage of EC2 instances**
  Deploying a database or a web application
- ☑ **Understand how to connect to an EC2 instance from your local machine**
  A key pair is needed to access an EC2 instance from your local machine.

A CLOUD GURU

Exploring Compute Services: EC2 in Action

AWS CERTIFIED CLOUD PRACTITIONER

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's take a look at launching an EC2 instance.

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Join us for the next lesson!

A CLOUD GURU

Exploring Compute Services: Lambda

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

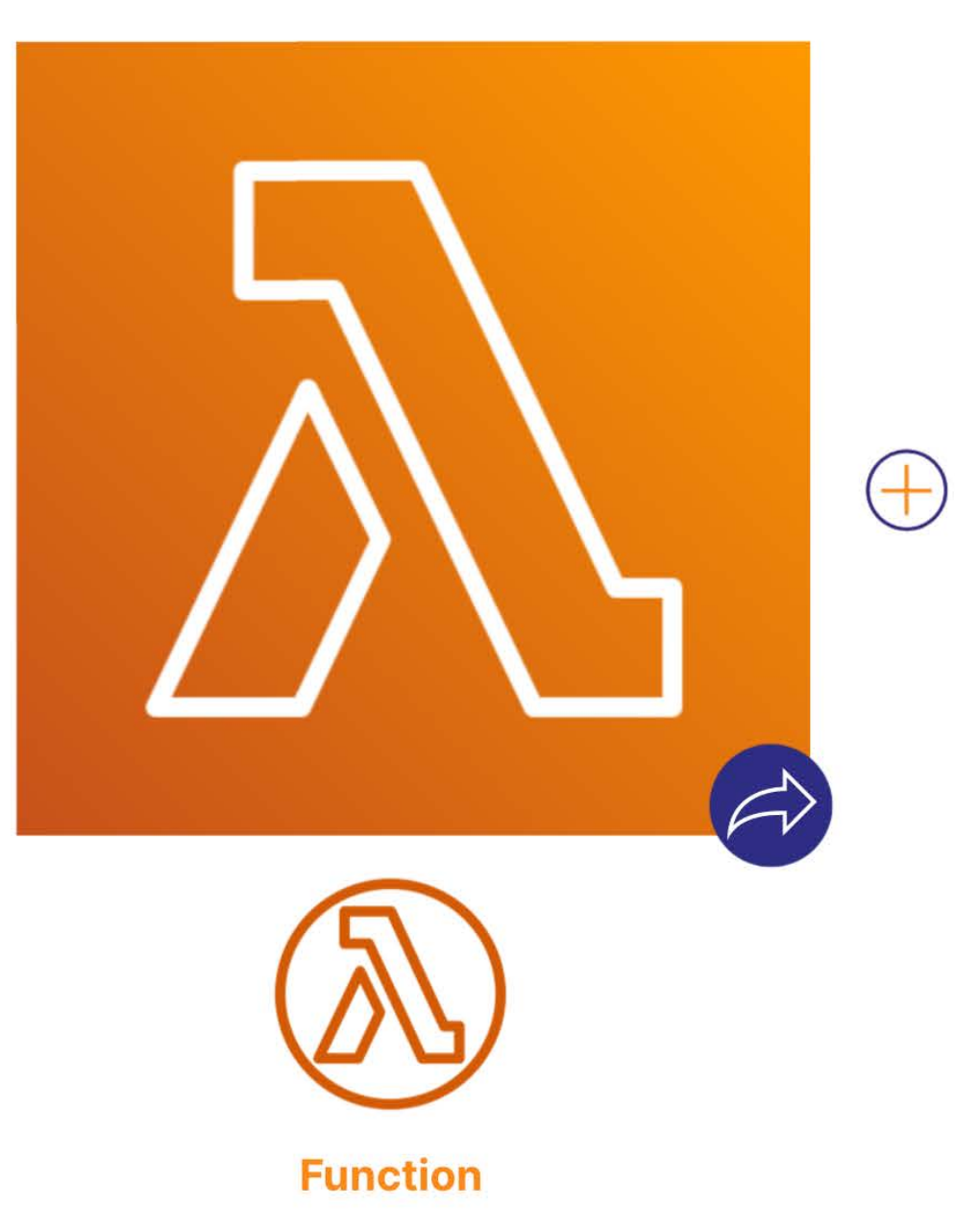
1. Lambda
2. Use Cases
3. Features
4. Pricing
5. Review

GET STARTED

LAMBDA

AWS Lambda

Lambda is a serverless compute service that lets you run code without managing servers.



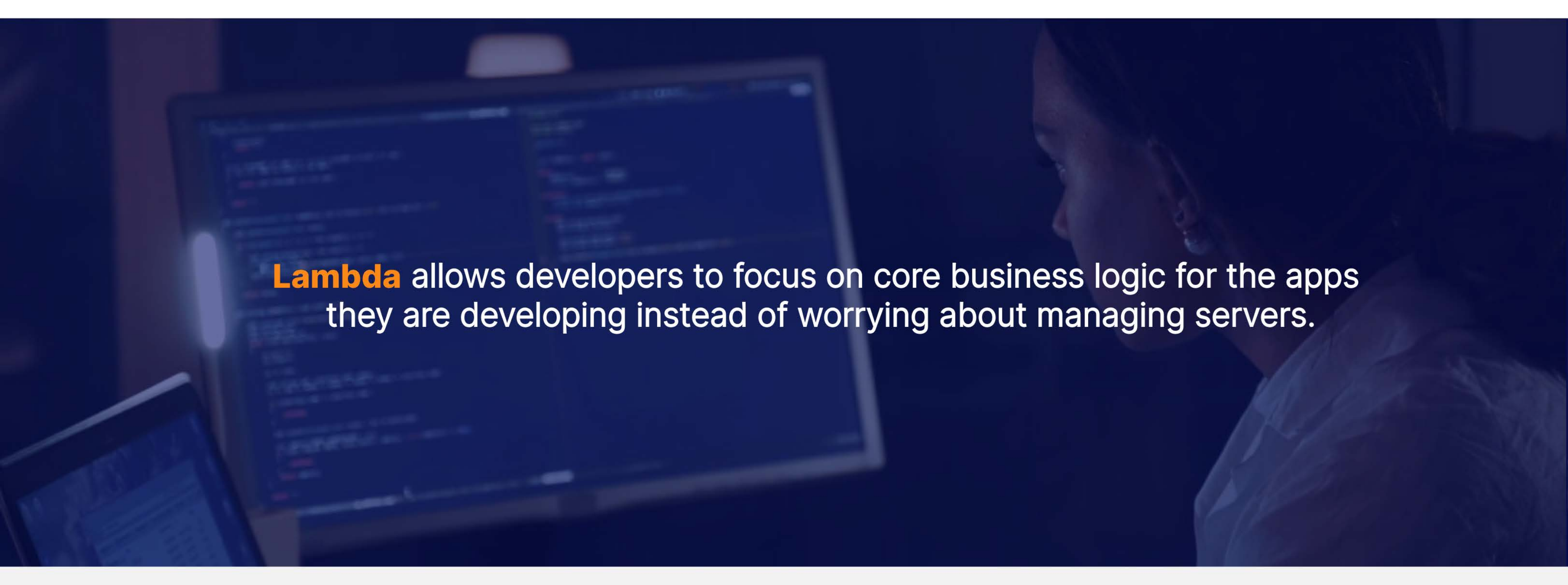
You author application code, called functions, using many popular languages.

Scales automatically

Serverless means you don’t worry about managing servers like with EC2.

The Bigger Picture

Let's discuss how **Lambda** fits into the bigger picture.



Lambda allows developers to focus on core business logic for the apps they are developing instead of worrying about managing servers.

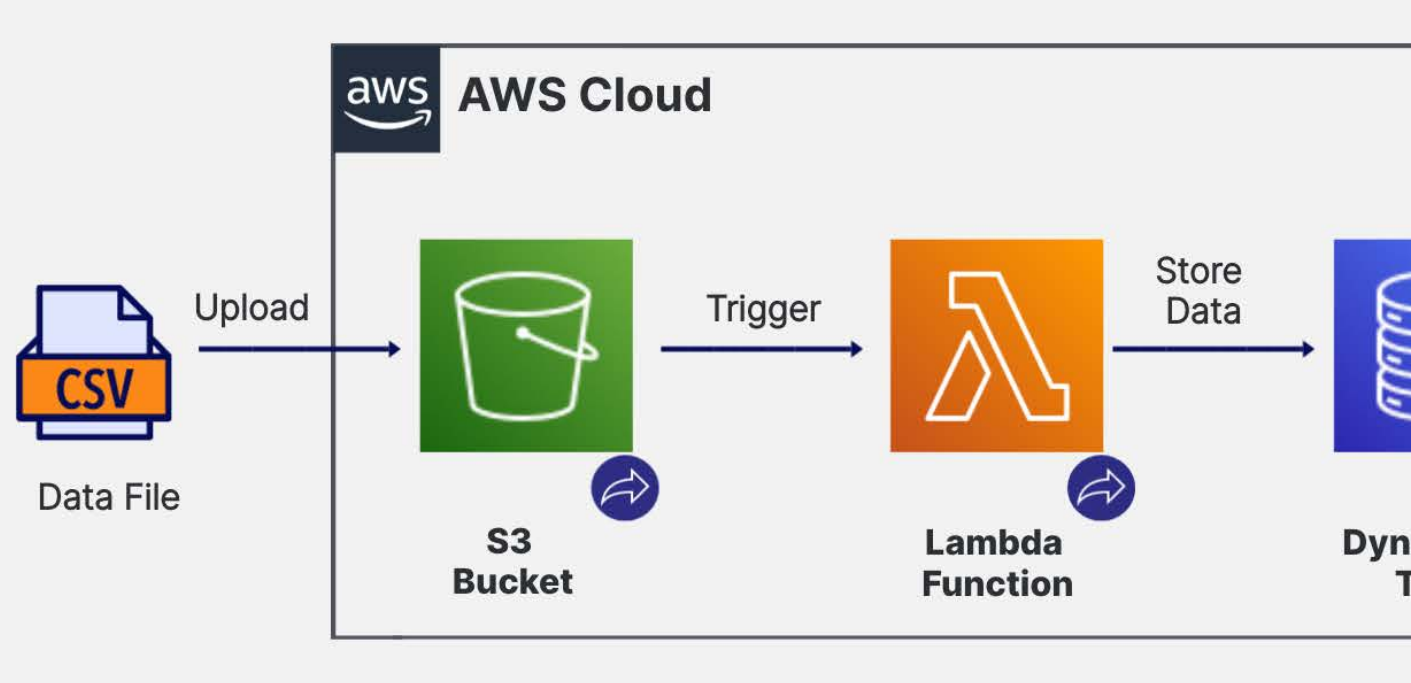
USE CASES

Lambda in the Real World

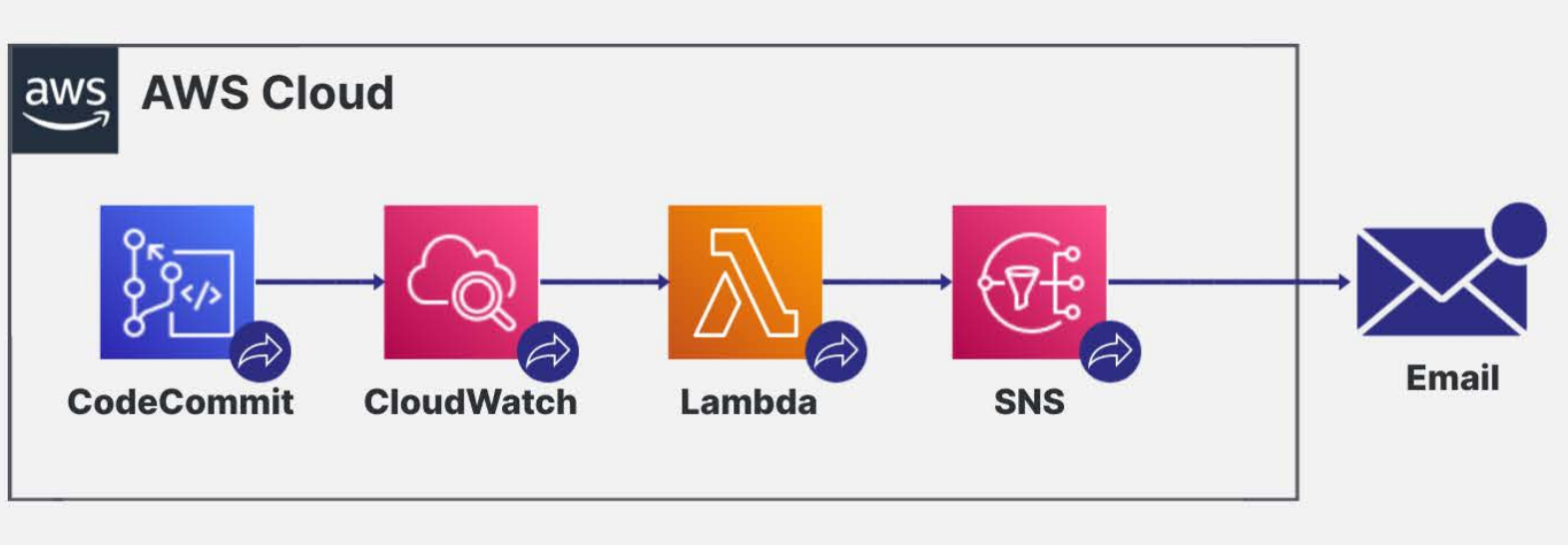
Lambda is a building block for many **serverless** applications.

Serverless simply means AWS manages the servers for you and you **cannot** access them. You can pretend they don't exist.

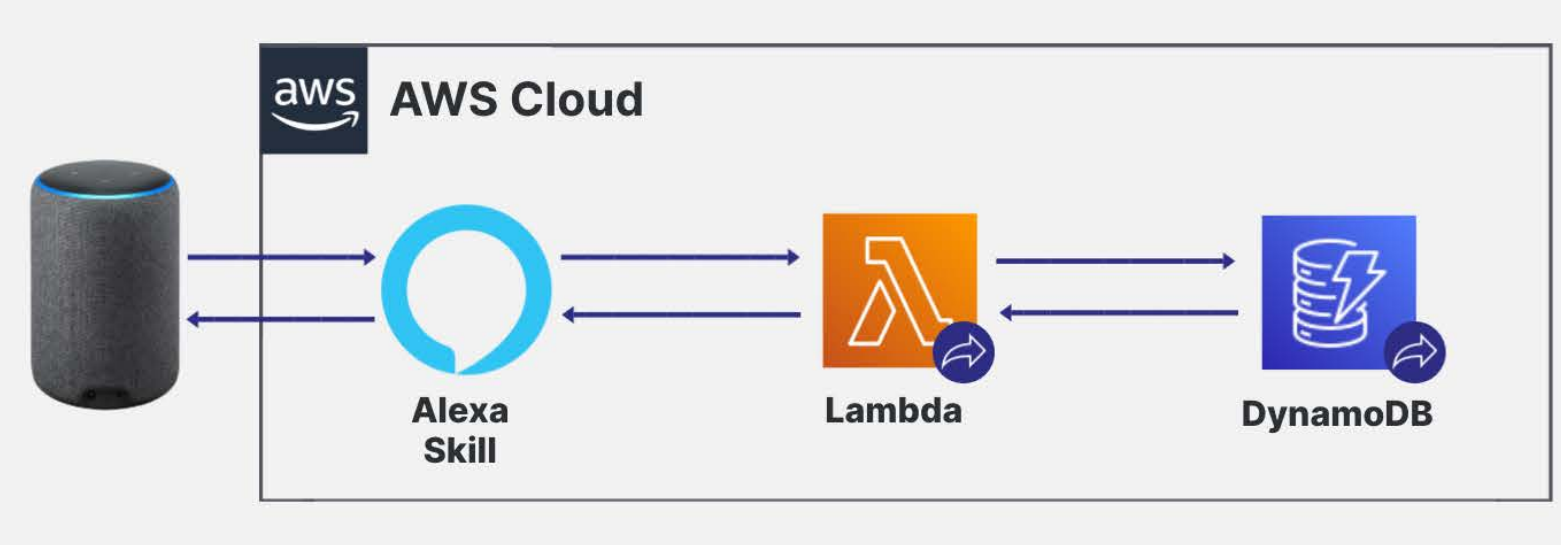
1 **Real-time file processing**



2 **Sending email notifications**



3 **Backend business logic**



FEATURES

Features

1 Supports popular programming languages like Java, Go, PowerShell, Node.js, C#, Python, and Ruby.

2 You author code using your favorite development environment or via the console.

3 Lambda can execute your code in response to events.

4 Lambda functions have a 15-minute timeout.

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's take a look at the Lambda console.

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PRICING

Pricing Model

You are charged based on the **duration** and **number of requests**.

1 **Compute time**

Pay only for compute time used — there is no charge if your code is not running.

2 **Request count**

A request is counted each time it starts execution. Test invokes in the console count as well.

3 **Always free**

The free usage tier includes 1 million free requests each month.

Review Time!

Lambda | Features | Pricing

Lambda

Lambda is a serverless compute service that lets you run code without managing servers.

Features

1 **Language Support**

Supports popular programming languages.

2 **Author Code**

You author code using your favorite development environment or via the console.

Pricing

1. Compute time
2. Request count
3. Always free

Things to Remember When Studying for the Exam

☑ **Your responsibility**

You are only responsible for your application code. AWS manages servers, coding environment, and language support.

☑ **Always free**

Even after the free-usage tier expires, you'll have access to 1 million free Lambda calls each month.

Join us for the next lesson!

A CLOUD GURU

Exploring Compute Services: Additional Compute Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1 Fargate
2 Lightsail
3 Outposts
4 Batch
5 Review

GET STARTED

Alfredo's Pizza

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FARGATE

AWS Fargate

Fargate is a serverless compute engine for containers.

Fargate allows you to manage containers, like Docker.

Scales automatically

Serverless means you don't worry about provisioning, configuring, or scaling servers.

LIGHTSAIL

Amazon Lightsail

Lightsail allows you to quickly launch all the resources you need for small projects.

Deploy preconfigured applications, like WordPress websites, at the click of a button

Simple screens for people with no cloud experience

Includes a virtual machine, SSD-based storage, data transfer, DNS management, and a static IP

Provides a low, predictable monthly fee, as low as $3.50

OUTPOSTS

AWS Outposts

Outposts allows you to run cloud services in your internal data center.

Supports workloads that need to remain on-premises due to latency or data processing needs.

AWS delivers and installs servers in your internal data center.

Used for a hybrid experience

Have access to the cloud services and APIs to develop apps on-premises

BATCH

AWS Batch

Batch allows you to process large workloads in smaller chunks (or batches).

Runs hundreds and thousands of smaller batch processing jobs

Dynamically provisions instances based on volume

Review Time!

Fargate | Lightsail | Outposts | Batch

Fargate

Fargate is a serverless compute engine for containers.

Lightsail

Lightsail allows you to quickly launch all the resources you need for small projects.

Outposts

Outposts allows you to run cloud services in your internal data center.

Batch

Batch allows you to process large workloads in smaller chunks (or batches).

Things to Remember When Studying for the Exam

☑ **Fargate**

AWS Fargate is considered serverless and is used to manage containers.

☑ **Lightsail**

Amazon Lightsail is a compute service that is used to quickly launch preconfigured applications for small projects.

☑ **Outposts**

AWS Outposts supports a hybrid deployment model.

☑ **Batch**

AWS Batch is a compute service that is used to process large workloads in smaller batches.

Join us for the next lesson!

A CLOUD GURU

Leveraging Storage Services: S3

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Simple Storage Service (S3)
2. Review

GET STARTED

The Bigger Picture

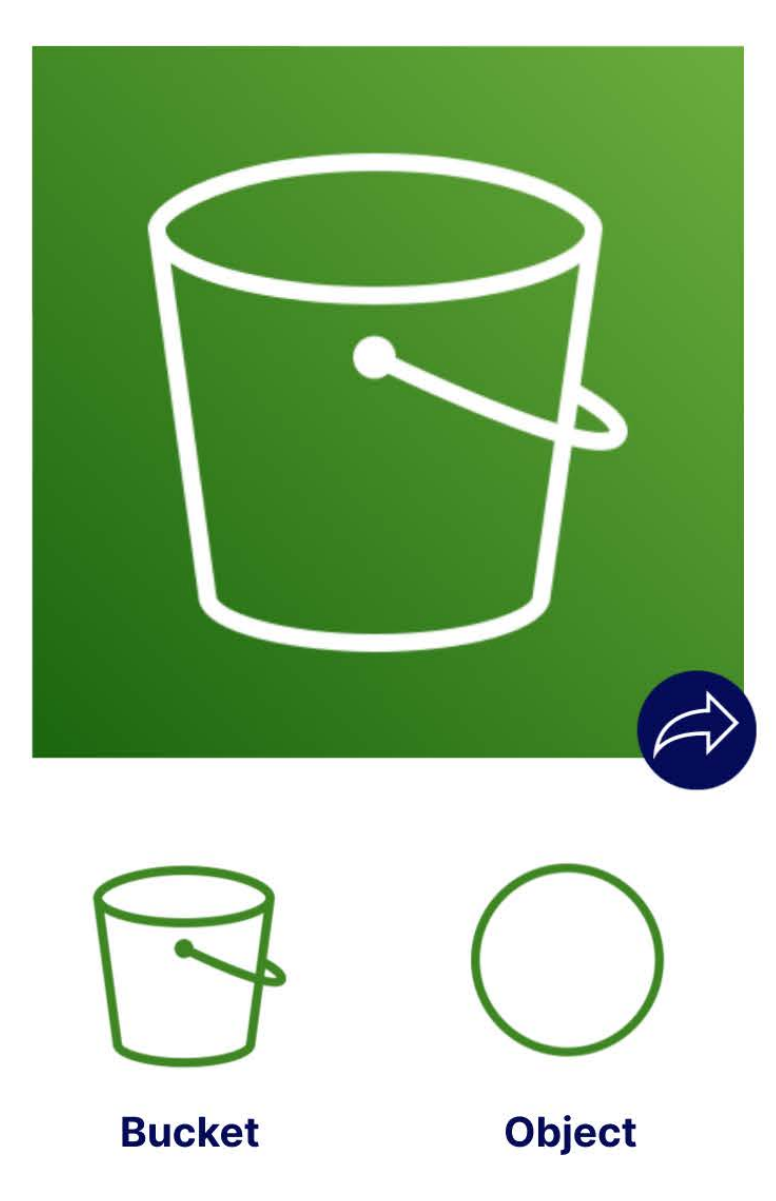
Let's discuss how **storage** fits in the bigger picture.

Companies today need to **collect**, **store**, and **analyze** the data they've accumulated over the years on a massive scale. Storage services in the cloud provide a place for companies to store data.

SIMPLE STORAGE SERVICE (S3)

Amazon Simple Storage Service
(Amazon S3)

S3 is an object storage service for the cloud that is highly available.



Objects (or files) are stored in buckets (or directories).

Essentially unlimited storage that can hold millions of objects per bucket.

Objects can be public or private.

You can upload objects via the console, the CLI, or programmatically from within code using SDKs.

Let's take a closer look

You can set security at the **bucket** level or **individual** object level using access control lists (ACLs), bucket policies, or access point policies.

You can **enable versioning** to create multiple versions of your file in order to protect against accidental deletion and to use a previous version.

You can use **S3 access logs** to track the access to your buckets and objects.

S3 is a **regional** service, but bucket names must be globally unique.

Data Accessibility

Durability and **availability** are 2 very different aspects of data accessibility.

1 Durability

Durability is important so your objects are never lost or compromised.

Amazon S3 Standard is designed for 99.999999999% (11 9's) of durability.

2 Availability

Availability is important so you can access your data quickly when you need it.

Amazon S3 Standard is designed for 99.99% availability.

S3 Storage Classes

Amazon S3 offers several storage classes designed for different use cases.

1. S3 Standard
2. S3 Intelligent-Tiering
3. S3 Standard-Infrequent Access (IA)
4. S3 One Zone-Infrequent Access (IA)
5. S3 Glacier
6. S3 Glacier Deep Archive
7. S3 Outposts

S3 Standard

- General-purpose storage
- Data stored across multiple Availability Zones
- Low latency and high throughput

Recommended for:

- Frequently accessed data

Durability of 99.999999999% **Availability of 99.99%**

S3 Intelligent-Tiering

- Automatically moves your data to the most cost-effective storage class
- Automatic cost savings
- No retrieval fees
- Data stored across multiple Availability Zones

Recommended for:

- Data with unknown or changing access pattern

Durability of 99.999999999% **Availability of 99.9%**

S3 Standard-Infrequent Access (IA)

- Data accessed less frequently but requires rapid access
- Data stored across multiple Availability Zones
- Cheaper than S3 Standard

Recommended for:

- Long-lived data
- Infrequently accessed
- Millisecond access when needed

Durability of 99.999999999% **Availability of 99.9%**

S3 One Zone-Infrequent Access (IA)

- Like S3 Standard-IA but data stored in a single Availability Zone
- Costs 20% less than S3 Standard-IA
- Data stored in this storage class can be lost

Recommended for:

- Re-creatable data
- Infrequently accessed with millisecond access
- Availability and durability not essential

Durability of 99.999999999% **Availability of 99.5%**

S3 Glacier

- Long-term data storage and archival for lower costs
- Data retrieval takes longer
- 3 retrieval options: 1-5 minutes, 3-5 hours, or 5-12 hours
- Data stored across multiple Availability Zones

Recommended for:

- Long-term backups
- Cheaper storage options

Durability of 99.999999999%

S3 Glacier Deep Archive

- Like S3 Glacier but longer access times
- 2 retrieval options: 12 hours or 48 hours
- Cheapest of all S3 options
- Data stored across multiple Availability Zones

Recommended for:

- Long-term data archival accessed once or twice a year
- Retaining data for regulatory compliance requirements

Durability of 99.999999999%

S3 Outposts

- Provides object storage on-premises
- A single storage class
- Store data across multiple devices and servers

Recommended for:

- Data that needs to be kept local
- Demanding application performance needs

S3 in the Real World

Let's discuss when you would use **S3** in the real world.

1 Static websites

Deploy static websites to S3 and use CloudFront for global distribution.

2 Data archive

Archive data using Amazon Glacier as a storage option for Amazon S3.

3 Analytics systems

Store data in Amazon S3 for use with analytics services like Redshift and Athena.

4 Mobile applications

Mobile application users can upload files to an Amazon S3 bucket.

Review Time!

S3

S3 is an object storage service with several storage classes:

1. S3 Standard
2. S3 Intelligent-Tiering
3. S3 Standard-Infrequent Access (IA)
4. S3 One Zone-Infrequent Access (IA)
5. S3 Glacier
6. S3 Glacier Deep Dive
7. S3 Outposts

Things to Remember When Studying for the Exam

☑ **S3**

S3 is a regional service but has a global namespace.

☑ **S3 storage classes**

S3 offers unlimited storage with many storage classes. Understand the use cases for each storage class.

Join us for the next lesson!

A CLOUD GURU

Leveraging
Storage Services: S3 in Action

AWS CERTIFIED CLOUD PRACTITIONER

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's take a look at creating an Amazon S3 bucket and uploading an object.

VIDEO IS NOT AVAILABLE ON PDF VERSION

Join us for the next lesson!

A CLOUD GURU

Leveraging Storage Services: Additional Storage Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

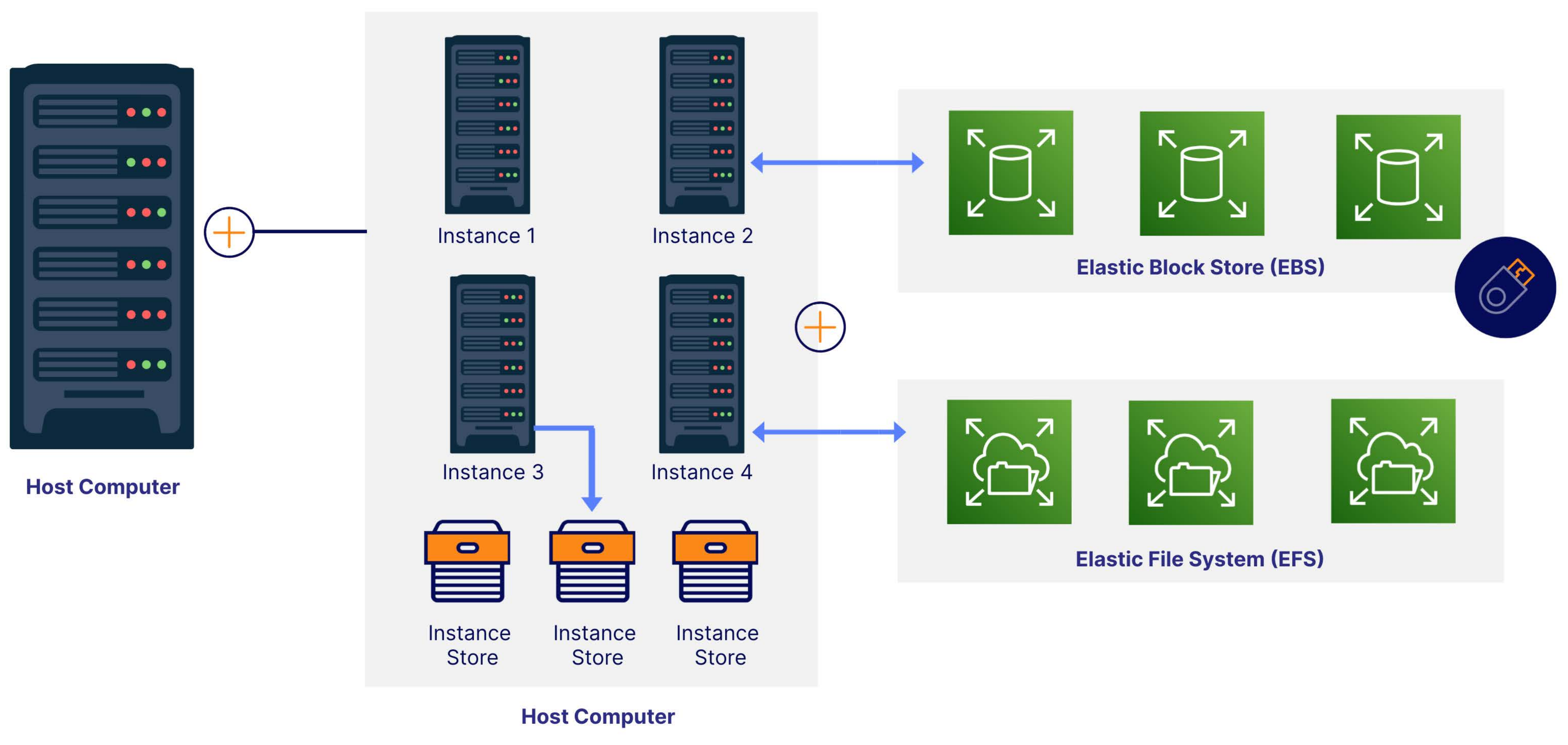
1. EC2 Storage
2. Elastic Block Store (EBS)
3. EC2 Instance Store
4. Elastic File System (EFS)
5. Storage Gateway
6. Review

GET STARTED

EC2 STORAGE

EC2 Storage — the Big Picture

EC2 supports several storage options for your instances.



AMAZON ELASTIC BLOCK STORE (EBS)

Amazon Elastic Block Store (EBS)

EBS is a storage device (called a volume) that can be attached to (or removed from) your instance.

In reality, volumes are virtualized spaces carved out of larger physical devices, but that's more than you need to know!

Data persists when the instance is not running

Tied to one Availability Zone

Can only be attached to one instance in the same Availability Zone

Recommended for:
- **Quickly accessible data**
- **Running a database on an instance**
- **Long-term data storage**

EC2 INSTANCE STORE

EC2 Instance Store

An **instance store** is local storage that is physically attached to the host computer and cannot be removed.

Storage on disks physically attached to an instance

Faster with higher I/O speeds

Storage is temporary since data loss occurs when the EC2 instance is stopped

Recommended for:
- **Temporary storage needs**
- **Data replicated across multiple instances**

Amazon Elastic File System (EFS)

Amazon Elastic File System (EFS)

EFS is a serverless network file system for sharing files.

Only supports the Linux file system

More expensive than EBS

Accessible across different Availability Zones in the same Region

Recommended for:
- **Main directories for business-critical apps**
- **Lift-and-shift existing enterprise apps**

STORAGE GATEWAY

Storage Gateway

Storage Gateway is a hybrid storage service.

Connect on-premises and cloud data

Supports a hybrid model

Recommended for:
- **Moving backups to the cloud**
- **Reducing costs for hybrid cloud storage**
- **Low latency access to data**

Review Time!

EC2 Storage | Storage Gateway

EC2 Storage

EC2 supports several storage options for your instances.

1. Elastic Block Store (EBS)
2. Instance Store
3. Elastic File System (EFS)

Storage Gateway

Storage Gateway is a hybrid storage service that connects on-premises and cloud data.

Things to Remember When Studying for the Exam

☑ **EBS**
Understand the use cases for EBS.

☑ **Instance store**
Don't forget instance store volumes are ephemeral or temporary.

☑ **EFS**
Don't forget EFS only supports Linux file systems.

☑ **Storage Gateway**
Storage Gateway supports hybrid models.

Join us for the next lesson!

A CLOUD GURU

Understanding Content Delivery Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. CloudFront
2. Global Accelerator
3. S3 Transfer Acceleration
4. Review

GET STARTED

The Bigger Picture

Let's discuss how **content delivery** fits in the bigger picture.

What is a **content delivery network (CDN)?**

CLICK HERE

A CDN is a mechanism to deliver content quickly and efficiently based on geographic location.

Do you remember **latency?**

CLICK HERE

Latency simply means the time it takes to respond to a request.

Low latency is good!

CLOUDFRONT

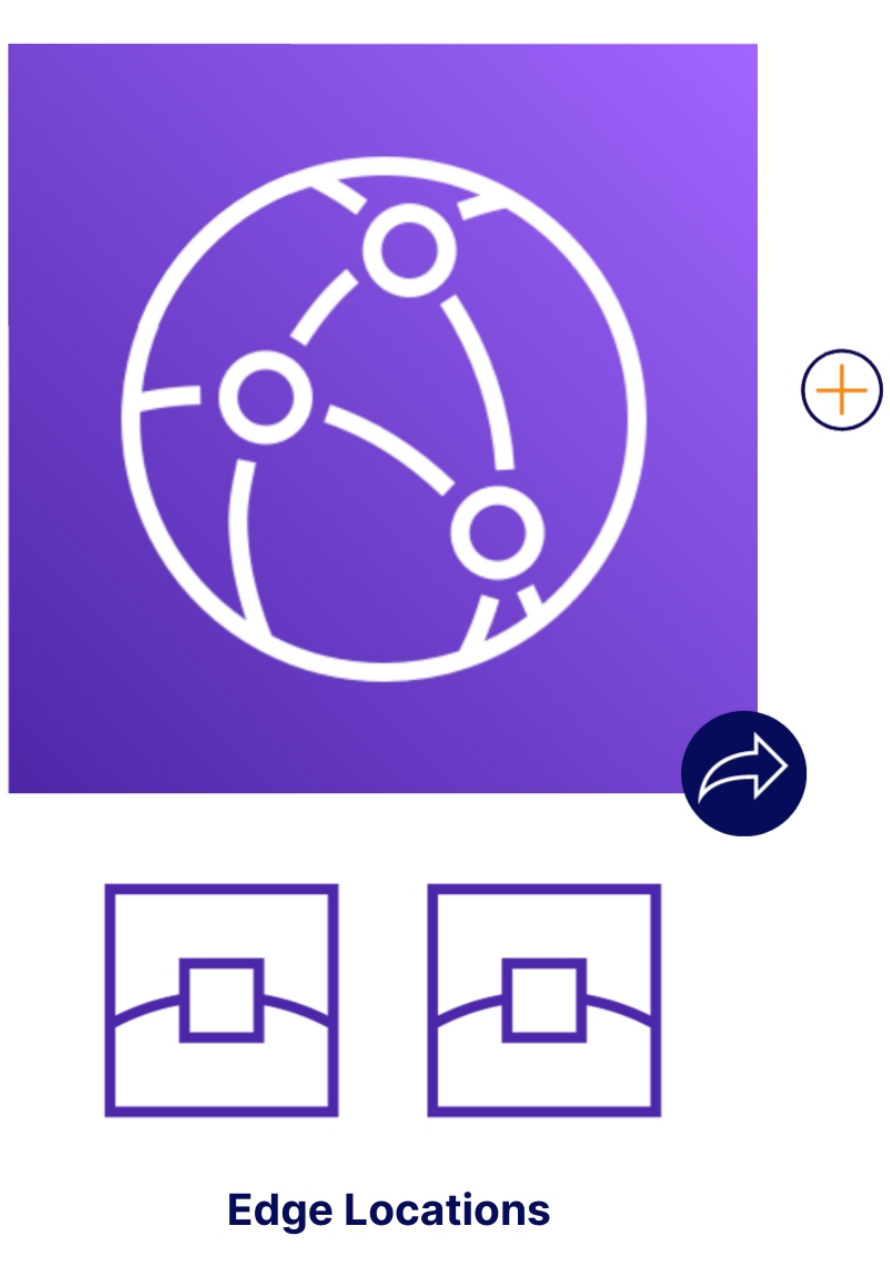
Amazon CloudFront

CloudFront is a CDN that delivers data and applications globally with low latency.

Makes content available globally or restricts it based on location

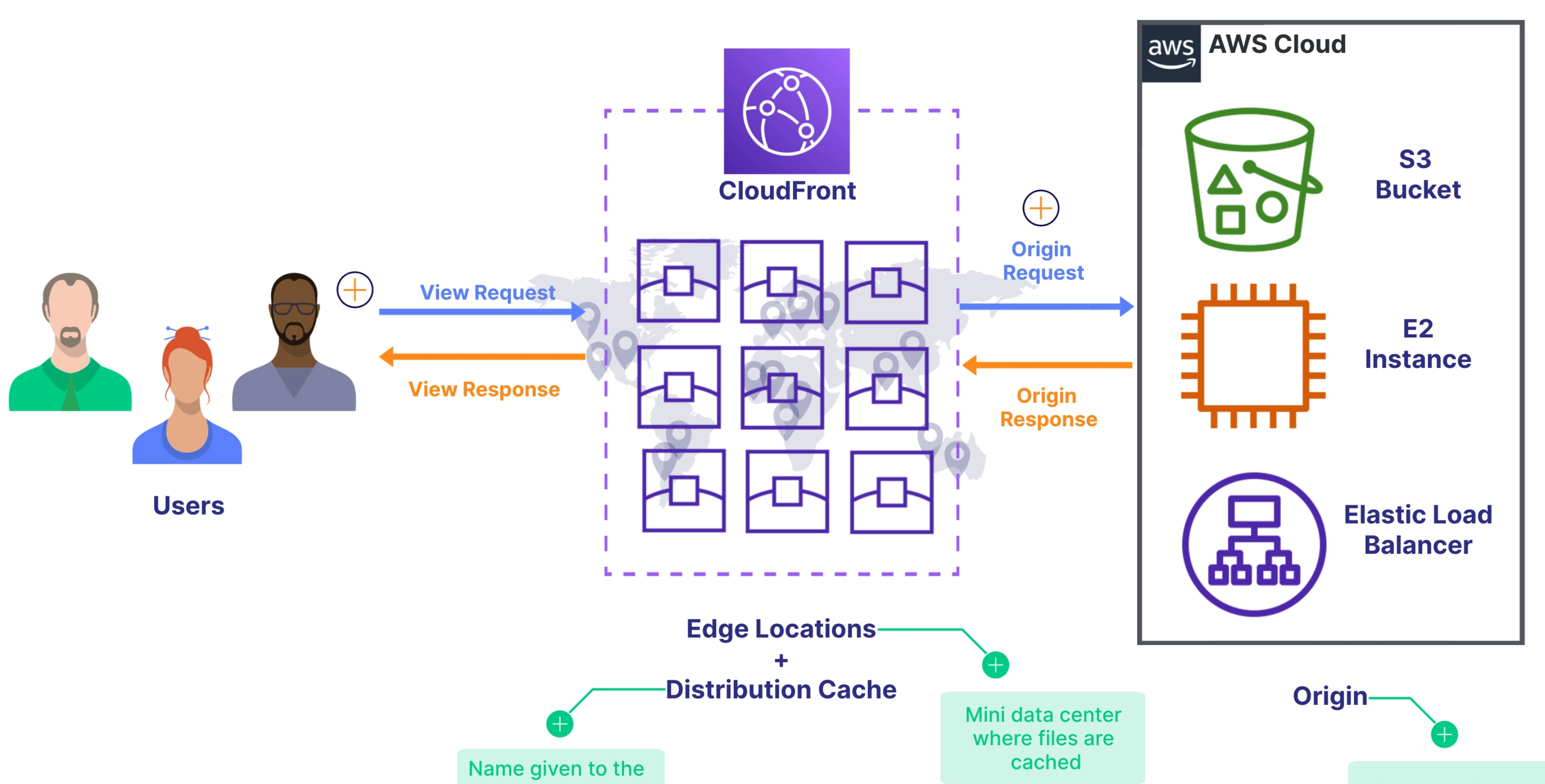
Speeds up delivery of static and dynamic web content

Uses edge locations to cache content



Do you remember edge locations from our global infrastructure lesson?

Did you know that if the content is already in the edge location, CloudFront delivers it immediately? If not, CloudFront retrieves the files from the origin.


CloudFront
AWS Cloud
S3 Bucket
E2 Instance
Elastic Load Balancer
Users
View Request
View Response
Origin Request
Origin Response
Edge Locations + Distribution Cache
Name given to the collection of edge locations
Mini data center where files are cached
Origin
The original source of the content

CloudFront in the Real World

Let's review how you'd use **CloudFront** in the real world.

1. **S3 static websites** — CloudFront is often used with S3 to deploy content globally.
2. **Prevent attacks** — CloudFront can stop certain web attacks, like DDoS. We'll talk more about DDoS in the security lesson.
3. **IP address blocking** — Geo-restriction prevents users in certain countries from accessing content.

GLOBAL ACCELERATOR

Amazon Global Accelerator

Global Accelerator sends your users through the AWS global network when accessing your content, speeding up delivery.

Improves latency and availability of single-Region applications

Sends traffic through the AWS global network infrastructure

60% performance boost

Automatically re-routes traffic to healthy available regional endpoints

ADDITIONAL STORAGE OPTION

Amazon S3 Transfer Acceleration

S3 Transfer Acceleration improves content uploads and downloads to and from S3 buckets.

Fast transfer of files over long distances

Uses CloudFront's globally distributed edge locations

Customers around the world can upload to a central bucket

Review Time!

CloudFront | Global Accelerator | S3 Transfer Acceleration

CloudFront

CloudFront is a CDN that delivers data and applications globally with low latency.

Global Accelerator

Global Accelerator sends your users through the AWS global network when accessing your content, speeding up delivery.

S3 Transfer Acceleration

S3 Transfer Acceleration improves content uploads and downloads to and from S3 buckets.

Things to Remember When Studying for the Exam

- ☑ **CloudFront**
  Don't forget CloudFront allows for global distribution of content.
- ☑ **Global Accelerator**
  Remember Global Accelerator provides low latency.
- ☑ **Security Features**
  Don't forget CloudFront has security features like DDoS protection and geo-restriction.
- ☑ **S3 Transfer Acceleration**
  Remember S3 Transfer Acceleration provides fast transfer of files over long distances.

Join us for the next lesson!

A CLOUD GURU

Understanding Networking Services: VPC and Subcomponents

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1 VPC and Subcomponents

2 Review

GET STARTED

The Bigger Picture

Let's discuss how **networking** fits in the bigger picture.

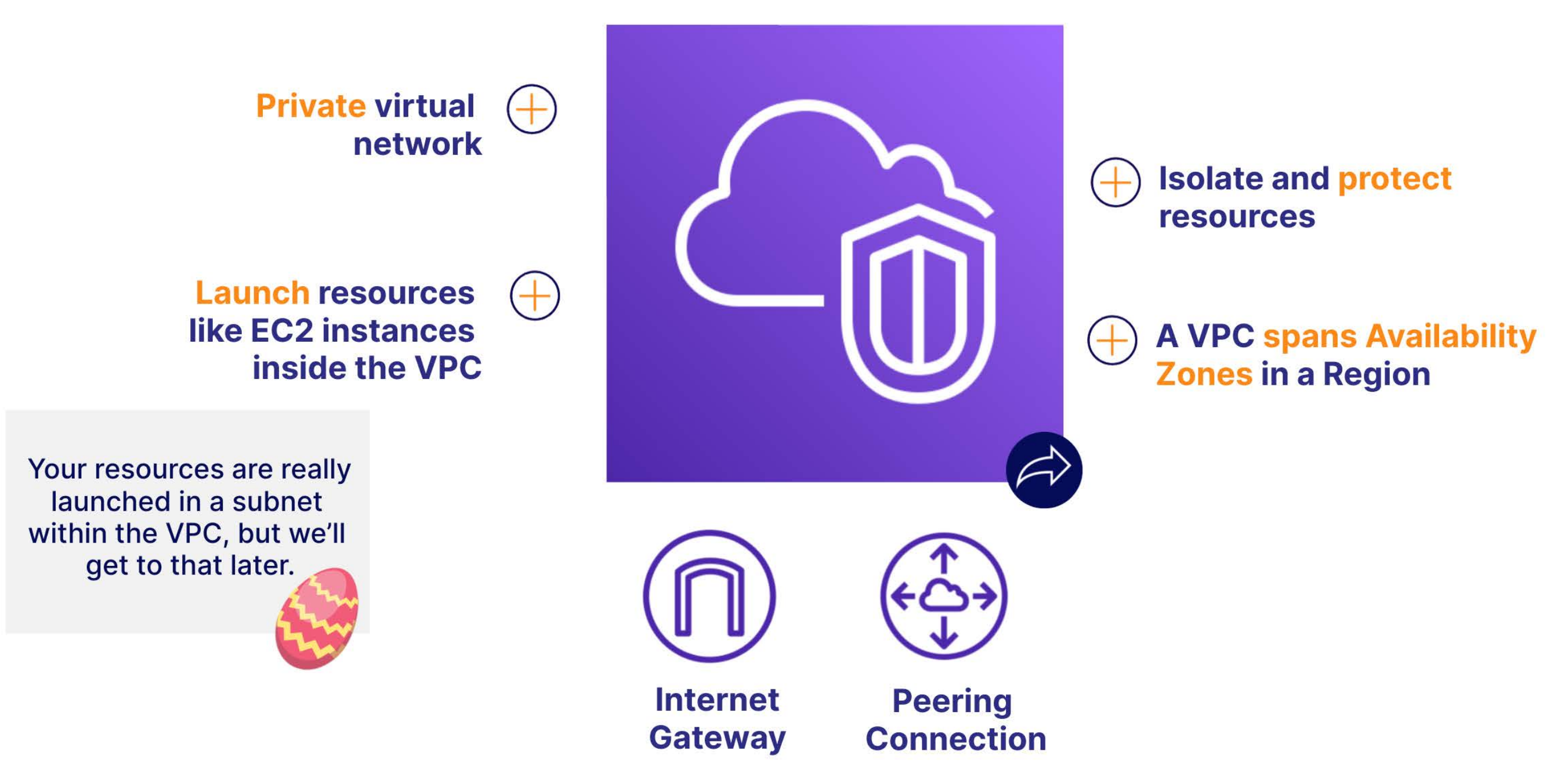
Networking connects computers together and allows for the sharing of data and applications, around the globe, in a **secure** manner using virtual routers, firewalls, and network management services.

Let's take a closer
look at virtual networks!

VPC AND SUBCOMPONENTS

Amazon Virtual Private Cloud (VPC)

VPC is a foundational service that allows you to create a secure private network in the AWS cloud where you launch your resources.



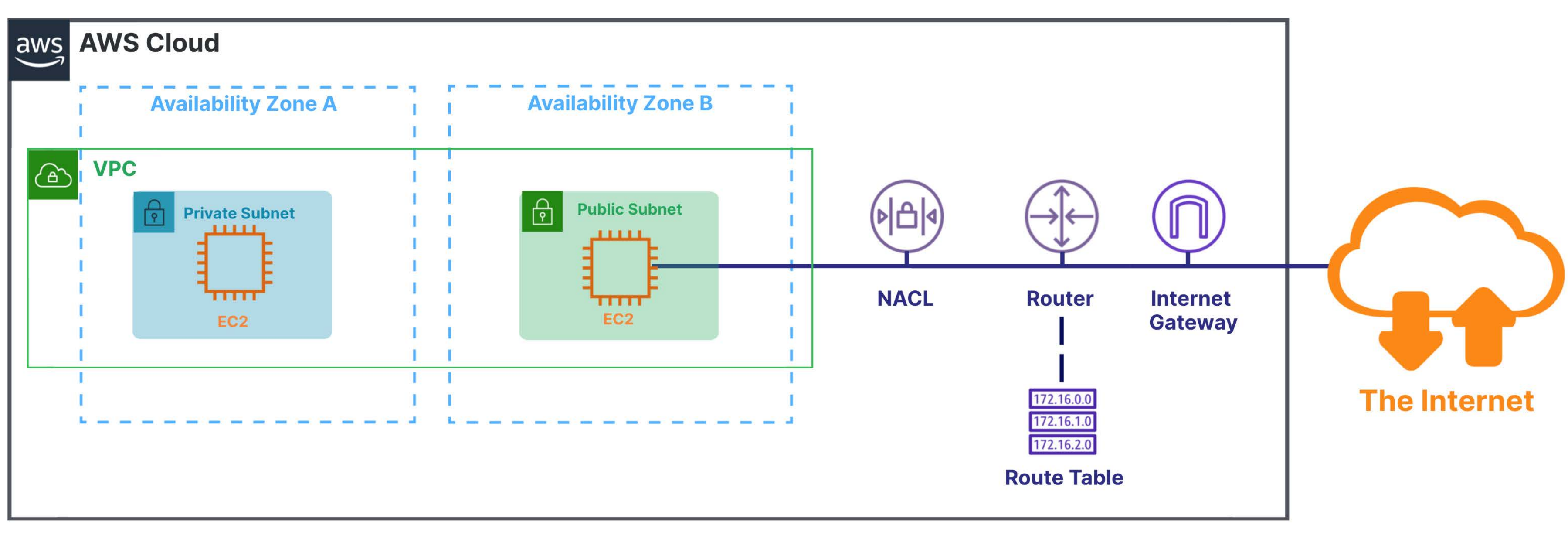
Private virtual network

Launch resources like EC2 instances inside the VPC

Your resources are really launched in a subnet within the VPC, but we'll get to that later.

Isolate and protect resources

A VPC spans Availability Zones in a Region



Router and Route Table

Defines where network traffic is routed

VPC

A VPC is a private network in the AWS cloud.

Network ACL

Access control lists (ACLs) ensure the proper traffic is allowed into the subnet.

AZ

Availability Zones (AZs) consist of one or more physically separated data centers, each with redundant power, networking, and connectivity, housed in separate facilities.

Subnet

A subnet allows you to split the network inside the VPC. This is where you launch resources like EC2 instances.

Internet Gateway

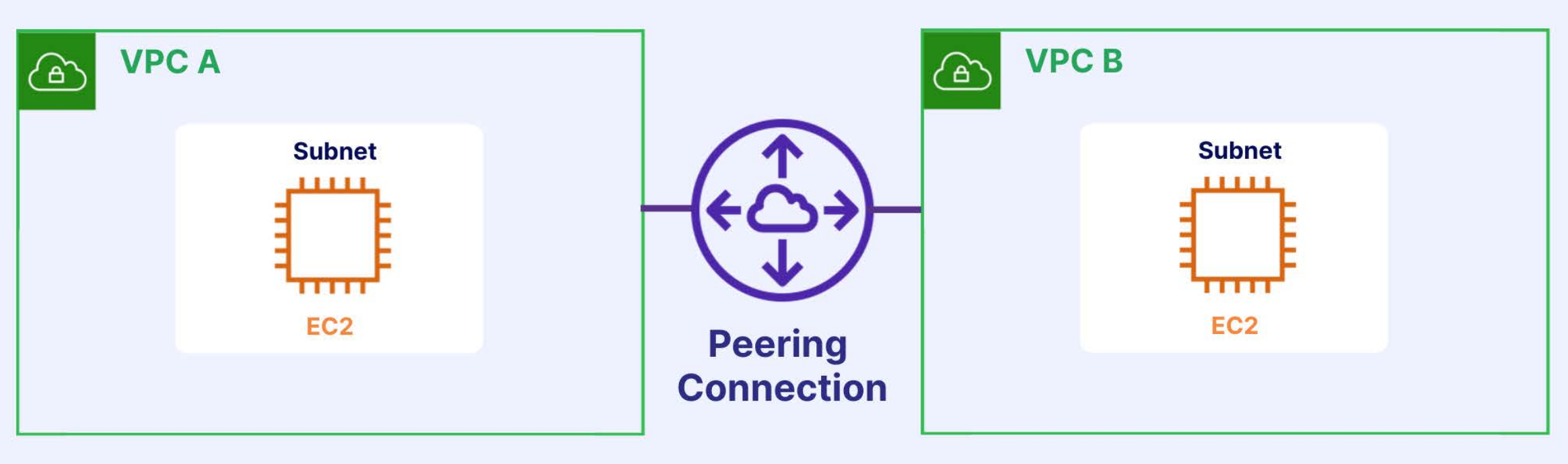
An internet gateway allows public traffic to the internet from a VPC.

The Internet

The internet really needs no explanation!

VPC peering allows you to connect 2 VPCs together.

Peering facilitates the transfer of data in a secure manner.

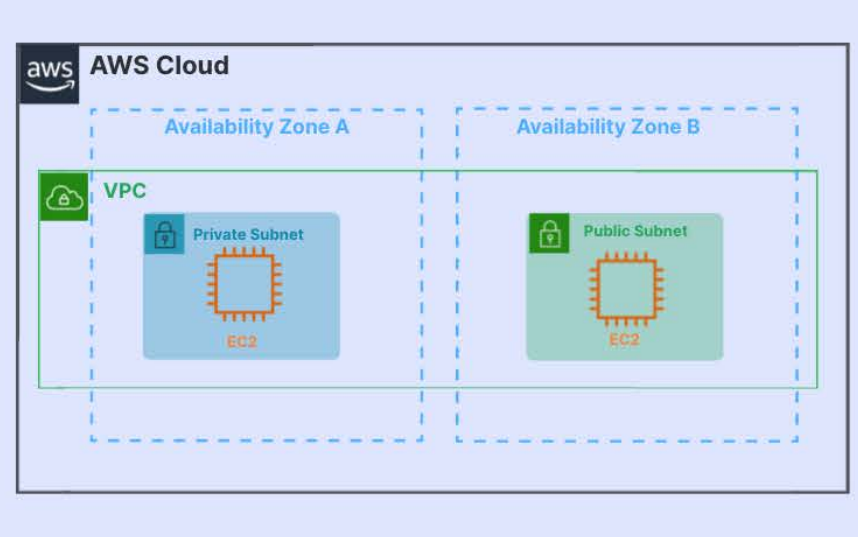


Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see how easy it is to set up a VPC.

VIDEO IS NOT AVAILABLE ON PDF VERSION

Review Time!



VPC and Subcomponents

VPC is a foundational service that allows you to create a secure private network in the AWS cloud where you launch your resources.

Things to Remember When Studying for the Exam

☑ **VPC**

Don't forget an internet gateway allows traffic to the public internet and peering connects 2 VPCs together.

Join us for the next lesson!

A CLOUD GURU

Understanding Networking Services: Additional Networking Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Route 53
2. Direct Connect
3. AWS VPN
4. Review

GET STARTED

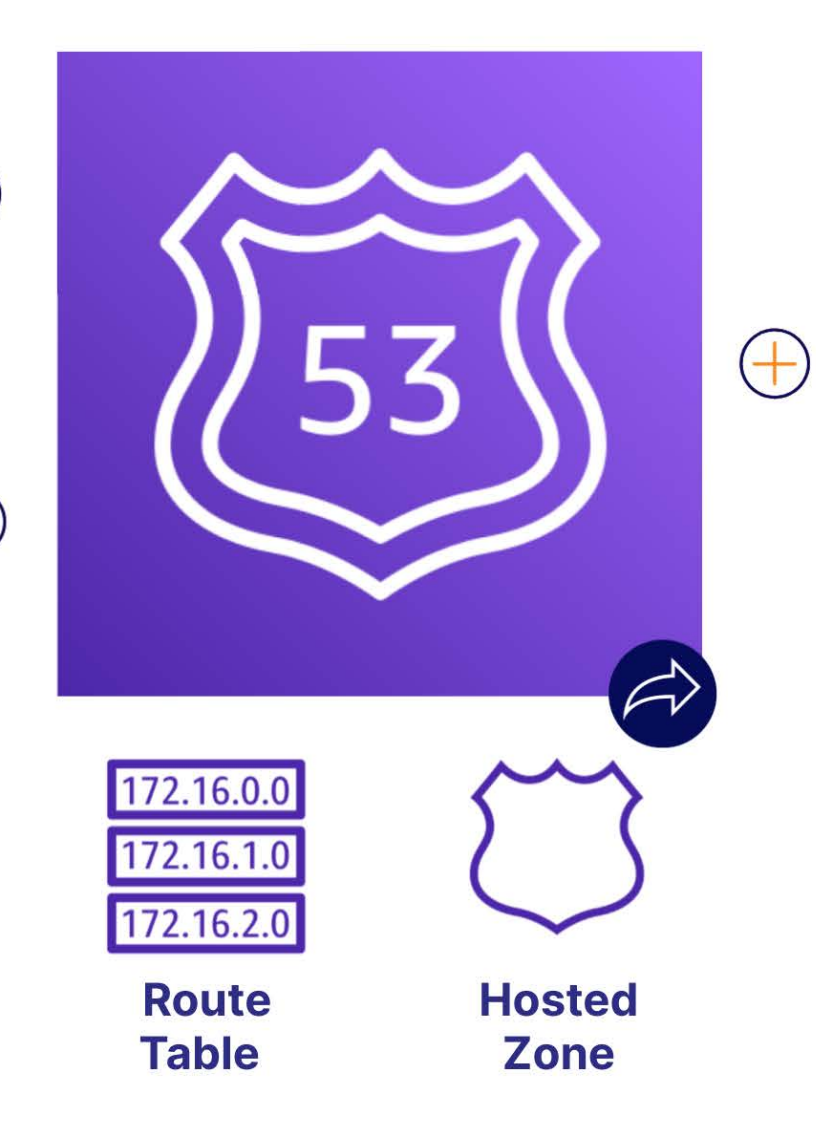
What Is DNS?

DNS stands for **Domain Name System** and directs internet traffic by connecting domain names with web servers.

ROUTE 53

Amazon Route 53

Route 53 is a DNS service that routes users to applications.



- Domain name registration
- Performs **health checks** on AWS resources
- Supports **hybrid** cloud architectures

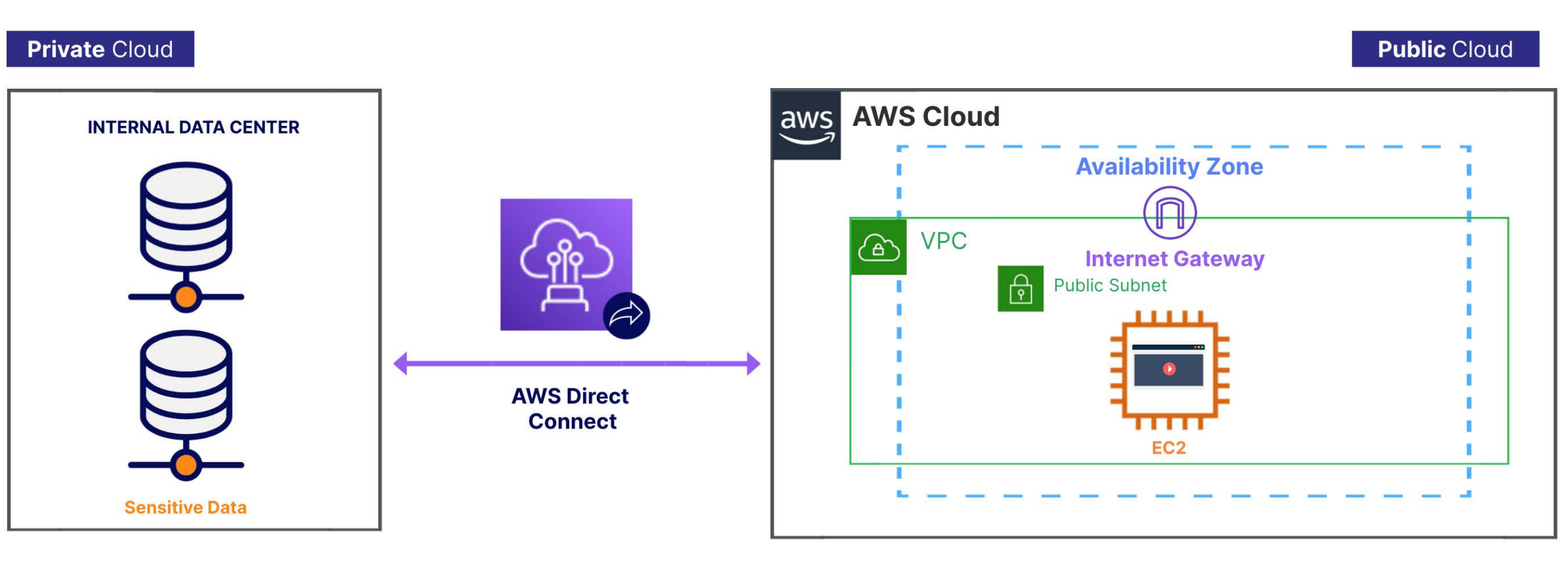
DIRECT CONNECT

AWS Direct Connect

Direct Connect is a dedicated physical network connection from your on-premises data center to AWS.

- Dedicated **physical** network connection
- Connects your **on-premises** data center to **AWS**
- Data travels over a **private network**
- Supports a **hybrid** environment

A **hybrid** cloud is a combination of **public** and **private** clouds.



Let's take a closer look at Direct Connect in the real world.

1 Large datasets
Transfer large datasets to AWS

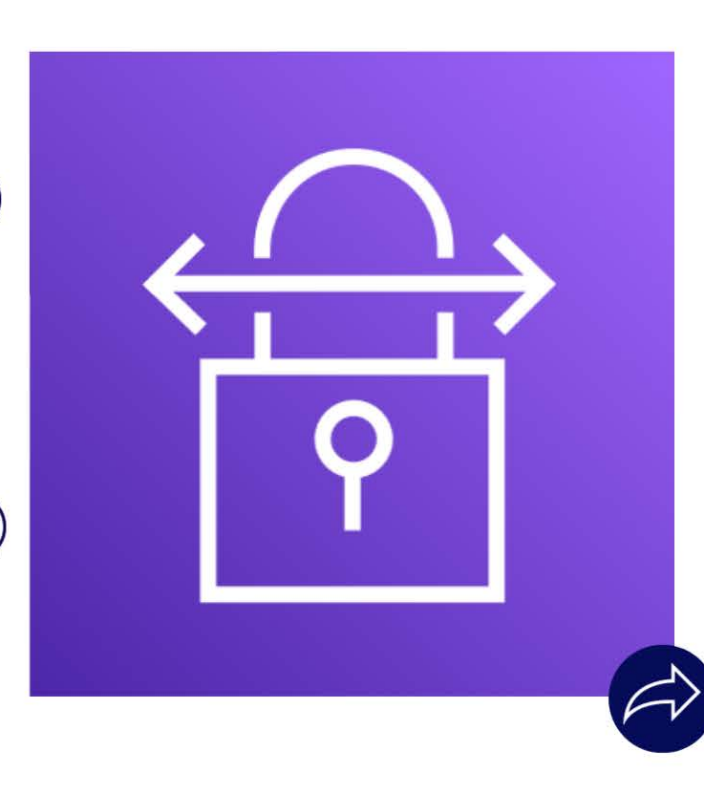
2 Business-critical data
Transfer internal data directly to AWS, bypassing your internet service provider

3 Hybrid model
Build hybrid environments

AWS VPN

AWS VPN

Site-to-Site VPN creates a secure connection between your internal networks and your AWS VPCs.

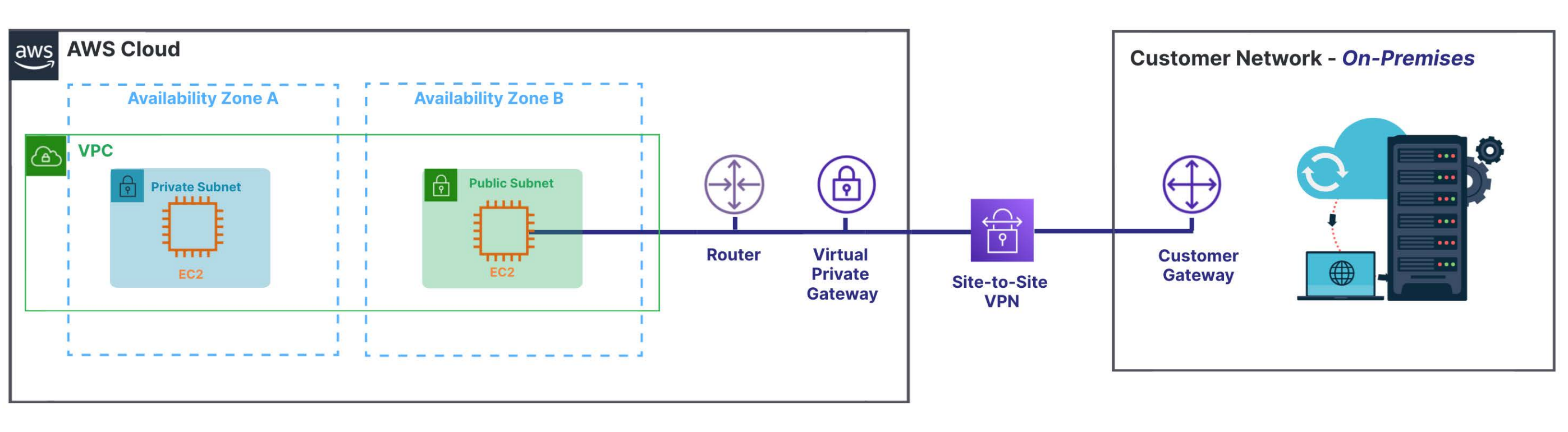


- Similar to Direct Connect, but data travels over the **public internet**
- Data is automatically **encrypted**
- Connects your **on-premises** data center to **AWS**
- Supports a **hybrid** environment

Site-to-Site VPN in the Real World

Moving Applications

A **Site-to-Site** VPN makes moving applications to the cloud easier.



AZ
Availability Zones (AZs) consist of one or more physically separated data centers, each with redundant power, networking, and connectivity, housed in separate facilities.

Customer Gateway
The VPN connector on the customer side

VPC
A VPC is a private network in the AWS cloud.

Router
Defines where network traffic is routed

Subnet
A subnet allows you to split the network inside the VPC. This is where you launch resources like EC2 instances.

Site-to-Site VPN
The secure connection between your internal networks and AWS

Virtual Private Gateway
The VPN connector on the AWS side

Review Time!

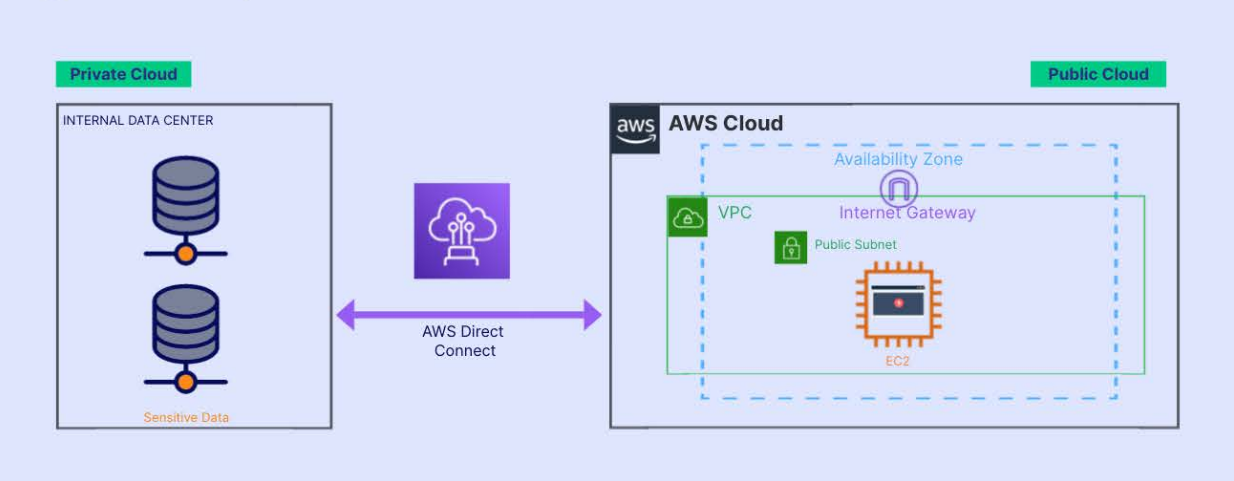
Route 53 | Direct Connect | Site-to-Site VPN

Route 53

Route 53 is a DNS service that routes users to applications.

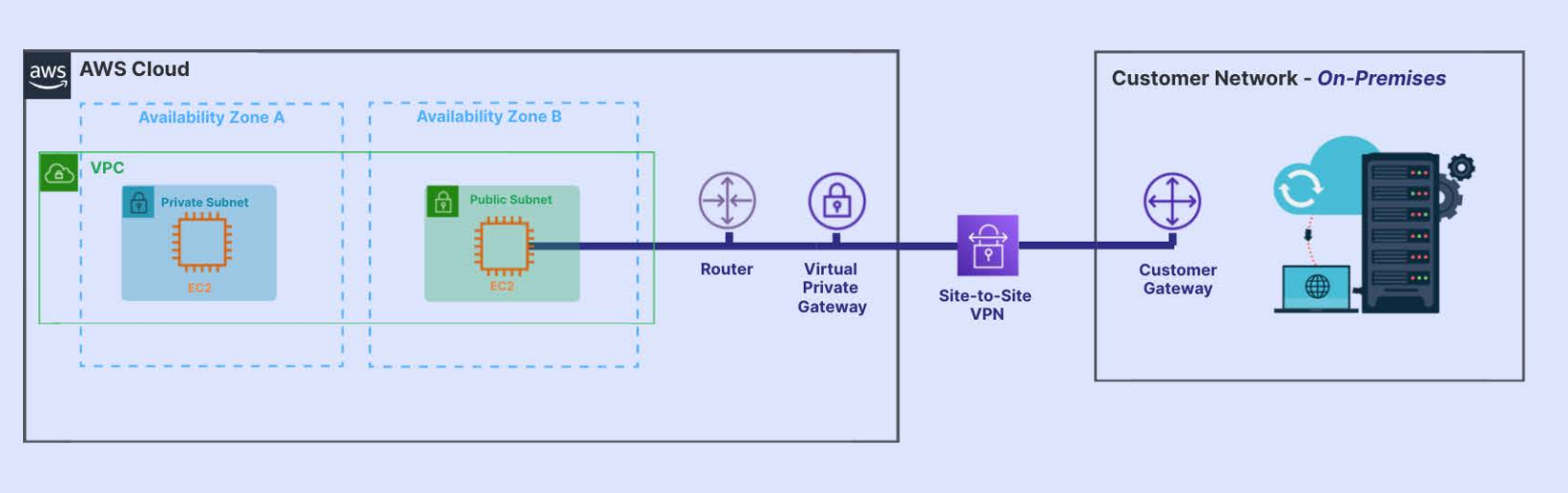
Direct Connect

Direct Connect is a dedicated physical network connection from your on-premises data center to AWS.



Site-to-Site VPN

Site-to-Site VPN creates a secure connection between your internal networks and your AWS VPCs.



Things to Remember When Studying for the Exam

☑ **Route 53**
Don't forget Route 53 performs health checks on AWS resources and supports a hybrid model.

☑ **Direct Connect**
Remember that Direct Connect supports a hybrid model.

☑ **Site-to-Site VPN**
Remember that a Site-to-Site VPN supports a hybrid model. Don't forget to review components such as the virtual private gateway and customer gateway.

Join us for the next lesson!

A CLOUD GURU

Utilizing Databases

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. RDS
2. Aurora
3. DynamoDB
4. DocumentDB
5. ElastiCache
6. Neptune
7. Review

GET STARTED

The Bigger Picture

Let's discuss how **databases** fit in the bigger picture.

Database

KEY TAKEAWAYS

- ☑ Databases allow us to collect, store, retrieve, sort, graph, and manipulate data.
- ☑ A database is an organized collection of various forms of data.
- ☑ Databases are used by many applications: web, mobile, services, and more.
- ☑ Databases are necessary to persist data through runs of an application.
- ☑ You access the data stored in a database by querying it.
- ☑ Databases are typically controlled by a database management system.

In the **AWS** ecosystem, there are many different types of databases that support different use cases.

Relational	Relational	NoSQL
RDS	Aurora	DynamoDB

Document	In-memory	Graph
DocumentDB	ElastiCache	Neptune

Let's take a closer look at some of the databases on AWS!

RDS

Amazon Relational Database Service (RDS)

RDS is a service that makes it easy to launch and manage relational databases.

- Supports popular database engines
- Offers high availability and fault tolerance using Multi-AZ deployment option
- AWS manages the database with automatic software patching, automated backups, operating system maintenance, and more.
- Launch read replicas across Regions in order to provide enhanced performance and durability.

Amazon Aurora | PostgreSQL | MySQL | MariaDB | ORACLE | Microsoft SQL Server

AURORA

Amazon Aurora

Aurora is a relational database compatible with **MySQL** and **PostgreSQL** that was created by **AWS**.

- Supports MySQL and PostgreSQL database engines
- 5x faster than normal MySQL and 3x faster than normal PostgreSQL
- Scales automatically while providing durability and high availability
- Managed by RDS

PostgreSQL | MySQL

DYNAMODB

Amazon DynamoDB

DynamoDB is a fully managed **NoSQL** key-value and document database.

- NoSQL key-value database
- Fully managed and serverless
- Non-relational
- Scales automatically to massive workloads with fast performance

Table | Item | Global Secondary Index

DOCUMENTDB

Amazon DocumentDB

DocumentDB is a fully managed document database that supports **MongoDB**.

- Document database
- MongoDB compatible
- Fully managed and serverless
- Non-relational

ELASTICACHE

Amazon ElastiCache

ElastiCache is a fully managed in-memory datastore compatible with **Redis** or **Memcached**.

- In-memory datastore
- Compatible with Redis or Memcached engines
- Data can be lost
- Offers high performance and low latency

ElastiCache for Memcached | ElastiCache for Redis

NEPTUNE

Amazon Neptune

Neptune is a fully managed graph database that supports highly connected datasets.

- Graph database service
- Supports highly connected datasets like social media networks
- Fully managed and serverless
- Fast and reliable

Let's take a closer look at databases in the real world.

Although the databases on AWS support multiple use cases, let's look at the **BEST** option for each use case.

1. Migrate an on-premises Oracle database to the cloud. – RDS
2. Migrate an on-premises PostgreSQL database to the cloud. – RDS, Aurora
3. Alleviate database load for data that is accessed often. – ElastiCache
4. Process large sets of user profiles and social interactions. – Neptune
5. NoSQL database fast enough to handle millions of requests per second. – DynamoDB
6. Operate MongoDB workloads at scale. – DocumentDB

Review Time!

RDS | Aurora | DynamoDB | DocumentDB | ElastiCache | Neptune

RDS

RDS is a service that makes it easy to launch and manage relational databases.

MariaDB | ORACLE | Microsoft SQL Server | Amazon Aurora | PostgreSQL | MySQL

Aurora

Aurora is a relational database compatible with MySQL and PostgreSQL that was created by AWS.

PostgreSQL | MySQL

DynamoDB

DynamoDB is a fully managed NoSQL key-value and document database.

DocumentDB

DocumentDB is a fully managed document database that supports MongoDB.

Neptune

Neptune is a fully managed graph database that supports highly connected datasets.

Things to Remember When Studying for the Exam

- ☑ **RDS**
  RDS is only for relational databases. Don't forget the supported database engines: Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle Database, and SQL Server.
- ☑ **Aurora**
  Don't forget Aurora only supports PostgreSQL and MySQL.
- ☑ **Neptune**
  Don't forget Neptune helps you create social media graphs.
- ☑ **DynamoDB**
  Going into the exam, don't forget DynamoDB is a NoSQL database.
- ☑ **ElastiCache**
  Keep in mind that ElastiCache is an in-memory datastore.
- ☑ **DocumentDB**
  Keep in mind that DocumentDB supports MongoDB.

Join us for the next lesson!

A CLOUD GURU

Exploring Migration and Transfer Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Database Migration Service (DMS)
2. Server Migration Service (SMS)
3. Snow Family
4. DataSync
5. Review

GET STARTED

The Bigger Picture

Let's discuss how **migration and transfer** fit in the bigger picture.

A lot of companies are **migrating** to the cloud, and they need **inexpensive**, **fast**, and **secure** ways to move their on-premises data to AWS.

DATABASE MIGRATION SERVICE

Database Migration Service (DMS)

DMS helps you migrate databases **to** or **within** AWS.

- Migrate on-premises databases to AWS
- Continuous data replication
- Supports homogeneous and heterogeneous migrations
- Virtually no downtime

DMS in the Real World

Let's discuss when you would use **DMS** in the real world.

1 Oracle to Aurora MySQL

Migrate an on-premises Oracle database to Aurora MySQL

2 Oracle to Oracle

Migrate an on-premises Oracle database to Oracle on EC2

3 RDS Oracle to Aurora MySQL

Migrate an RDS Oracle database to Aurora MySQL

SERVER MIGRATION SERVICE

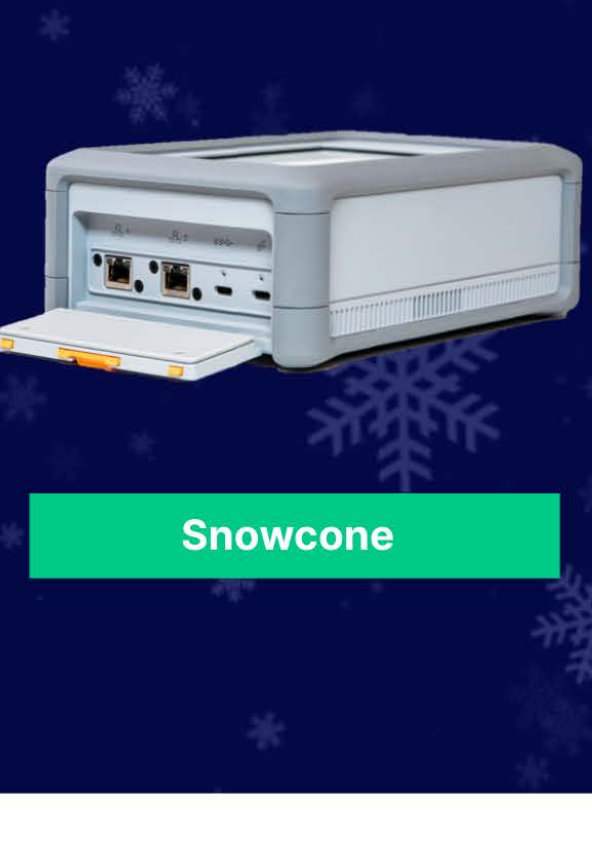
Server Migration Service (SMS)

SMS allows you to migrate on-premises servers to AWS.

- Migrates on-premises servers to AWS
- Server saved as a new Amazon Machine Image (AMI)
- Use AMI to launch servers as EC2 instances

SNOW FAMILY

The AWS Snow Family



Snowcone

Snowcone and Snowball

Snowmobile

Snow Family

The **Snow Family** allows you to transfer **large** amounts of on-premises data to AWS using a **physical device**.

Snowcone

- Smallest member of data transport devices
- 8 terabytes of usable storage
- Offline shipping
- Online with DataSync

Snowball and Snowball Edge

- Petabyte-scale data transport solution
- Transfer data in and out
- Cheaper than internet transfer
- Snowball Edge supports EC2 and Lambda

Snowmobile

- Multi-petabyte or exabyte scale
- Data loaded to S3
- Securely transported

DATASYNC

DataSync

DataSync allows for **online** data transfer from on-premises to AWS storage services like **S3** or **EFS**.

- Migrates data from on-premises to AWS
- Copy data over Direct Connect or the internet
- Copy data between AWS storage services
- Replicate data cross-Region or cross-account

Review Time!

DMS | SMS | Snow Family | DataSync

DMS

DMS helps you migrate databases to or within AWS.

DataSync

DataSync allows for online data transfer from on-premises to AWS storage services like S3 or EFS.

SMS

SMS allows you to migrate on-premises servers to AWS.

Snow Family

The Snow Family allows you to transfer large amounts of on-premises data to AWS using a physical device.

Things to Remember When Studying for the Exam

☑ **Snowball Edge**

When going into the exam, don't forget the services natively supported by Snowball Edge, like EC2 and Lambda.

☑ **Snowmobile**

Don't forget Snowmobile is the largest member of the transport family and supports exabyte-scale data.

☑ **Snowball**

Remember that Snowball transfers petabytes of data and is cheaper than transferring over the internet.

☑ **DataSync**

Don't forget DataSync transfers data online and can be used to replicate data cross-Region or cross-account.

Join us for the next lesson!

A CLOUD GURU

Leveraging Analytics Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Redshift
2. Athena
3. Glue
4. Kinesis
5. EMR
6. Data Pipeline
7. Review

GET STARTED

The Bigger Picture

Let's take a closer look at **data warehousing**.

What is a **data warehouse?**

CLICK HERE

A data warehouse is a data storage solution that aggregates massive amounts of historical data from disparate sources.

What are the **benefits** of a **data warehouse?**

CLICK HERE

Data warehouses support querying, reporting, analytics, and business intelligence. They are not used for transaction processing.

REDSHIFT

Amazon Redshift

Redshift is a scalable data warehouse solution.

- Data warehousing solution
- Improves speed and efficiency
- Handles exabyte-scale data

Redshift in the Real World

Let's discuss when you would use **Redshift** in the real world.

1 Data consolidation

When you need to consolidate multiple data sources for reporting

2 Relational databases

When you want to run a database that doesn't require real-time transaction processing (insert, update, and delete)

The Bigger Picture

Analytics is the act of querying or processing your data.

There are several services that allow you to gain deeper insights, enhance decision-making, and act in real time to what your data is telling you.

ATHENA

Athena

Athena is a query service for Amazon S3.

- Query service
- Analyze S3 data using SQL
- Pay per query
- Considered serverless

Athena

GLUE

Glue

Glue prepares your data for analytics.

- Extract, transform, load (ETL) service
- Prepare and load data
- Helps to better understand your data

Glue

Crawler

Glue Data Catalog

KINESIS

Kinesis

Kinesis allows you to analyze data and video streams in real time.

- Analyze real-time, streaming data
- Supports video, audio, application logs, website clickstreams, and IoT

Kinesis

EMR

Elastic MapReduce (EMR)

EMR helps you process large amounts of data.

- Process big data
- Analyze data using Hadoop
- Works with big data frameworks

EMR

DATA PIPELINE

Data Pipeline

Data Pipeline helps you move data between compute and storage services running either on AWS or on-premises.

- Moves data at specific intervals
- Moves data based on conditions
- Sends notifications on success or failure

Data Pipeline

Analytics in the Real World

Let's discuss when you would use **analytics** services in the real world.

1 Search data in S3

Athena helps you query historical data stored in S3 as if they were relational data using standard SQL.

2 Log analytics

Kinesis helps you analyze logs in near real time for application monitoring or fraud detection.

Review Time!

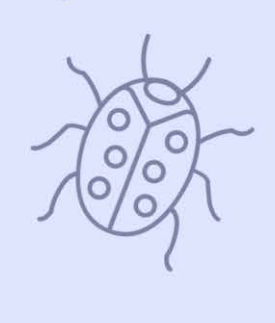
Redshift | Athena | Glue | Kinesis | EMR | Data Pipeline

Athena

Athena is a query service for Amazon **S3**.

Glue

Glue prepares your data for analytics.

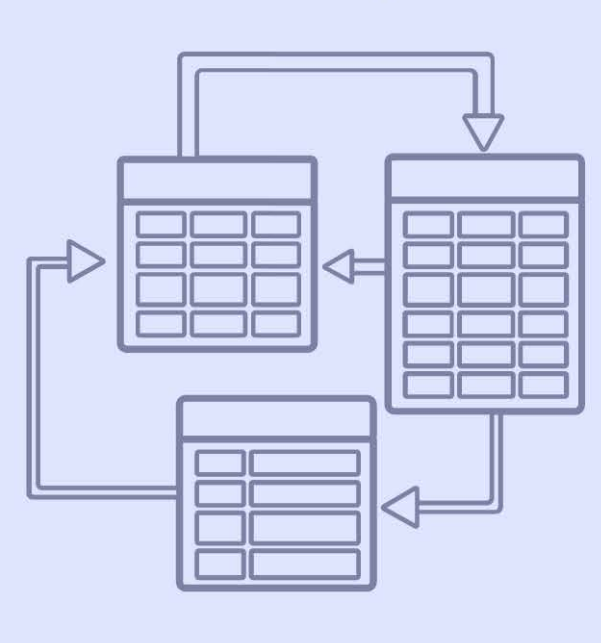


Redshift

Redshift is a scalable data warehouse solution.

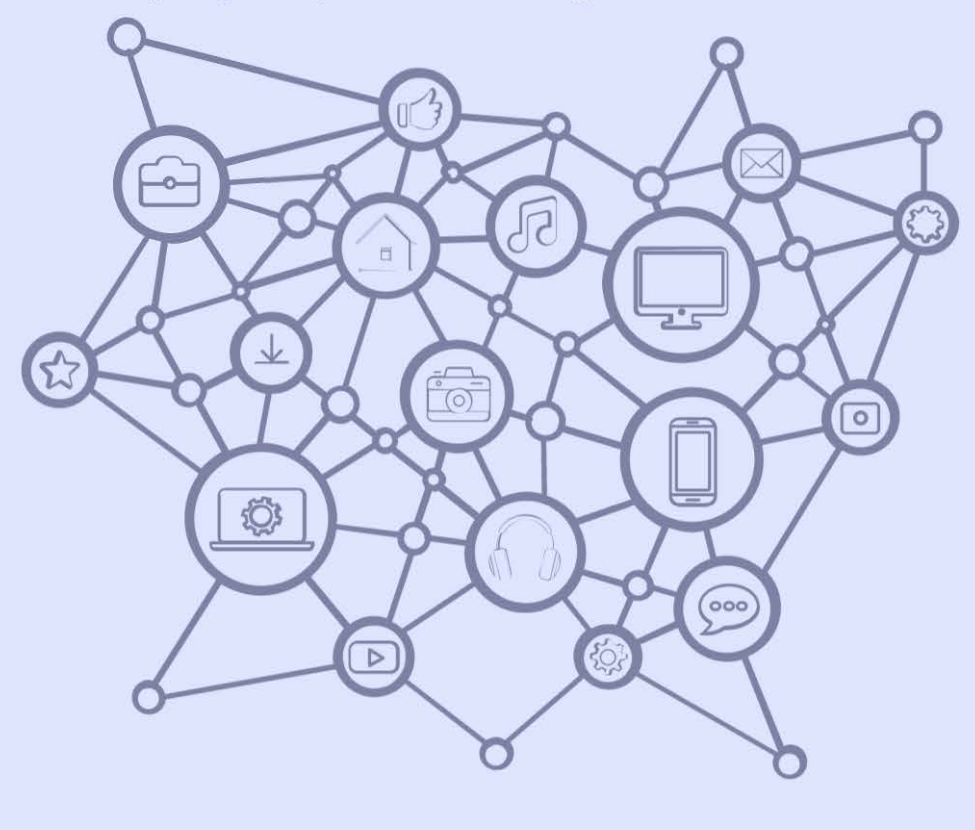
Data Pipeline

Data Pipeline helps you move data between compute and storage services running either on AWS or on-premises.



EMR

EMR helps you process large amounts of data.



Kinesis

Kinesis allows you to analyze data and video streams in real time.

Things to Remember When Studying for the Exam

☑ **Athena**

Going into the exam, don't forget Athena is used to query S3.

☑ **Redshift**

Going into the exam, don't forget the real-world use cases of Redshift.

Join us for the next lesson!

A CLOUD GURU

Leveraging Machine Learning Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Rekognition
2. Comprehend
3. Polly
4. SageMaker
5. Translate
6. Lex
7. Review

GET STARTED

The Bigger Picture

Artificial intelligence (AI) teaches computers to do things that normally require human intelligence.

Businesses leverage AI and machine learning to add intelligence to their applications and leverage trends and patterns in data.

REKOGNITION

Rekognition

Rekognition allows you to automate your image and video analysis.

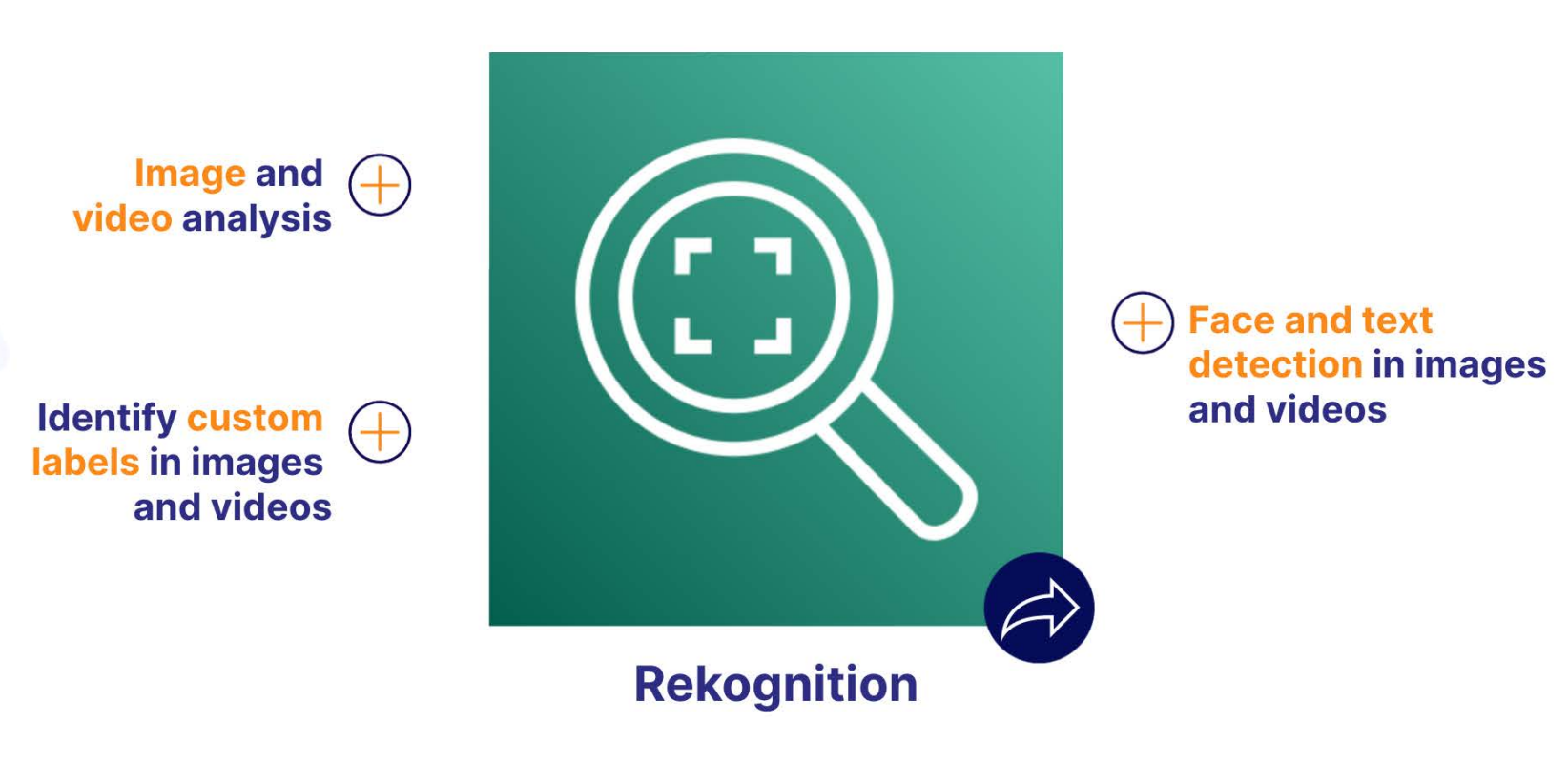


Image and video analysis

Identify custom labels in images and videos

Face and text detection in images and videos

Rekognition

Rekognition in the Real World

Analyze pizza images

Rekognition could help Alfredo identify the toppings on his pizzas to make sure they are being made consistently. This would be a great way to train new employees and ensure food quality!

Watch below for a quick demo!

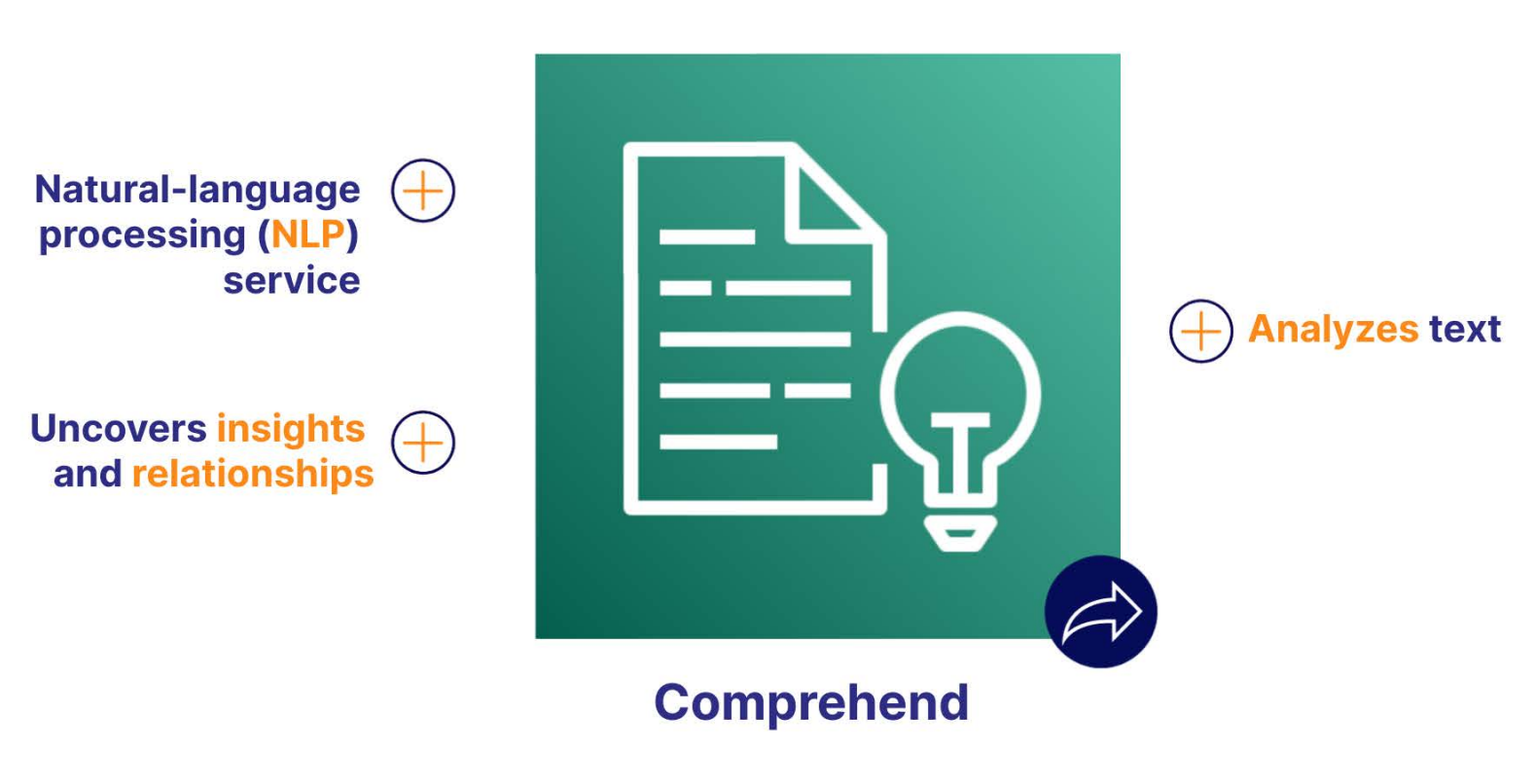
In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see Rekognition in action.

VIDEO IS NOT AVAILABLE ON PDF VERSION

COMPREHEND

Comprehend

Comprehend is a natural-language processing (NLP) service that finds relationships in text.



Natural-language processing (NLP) service

Uncovers insights and relationships

Analyzes text

Comprehend

Comprehend in the Real World

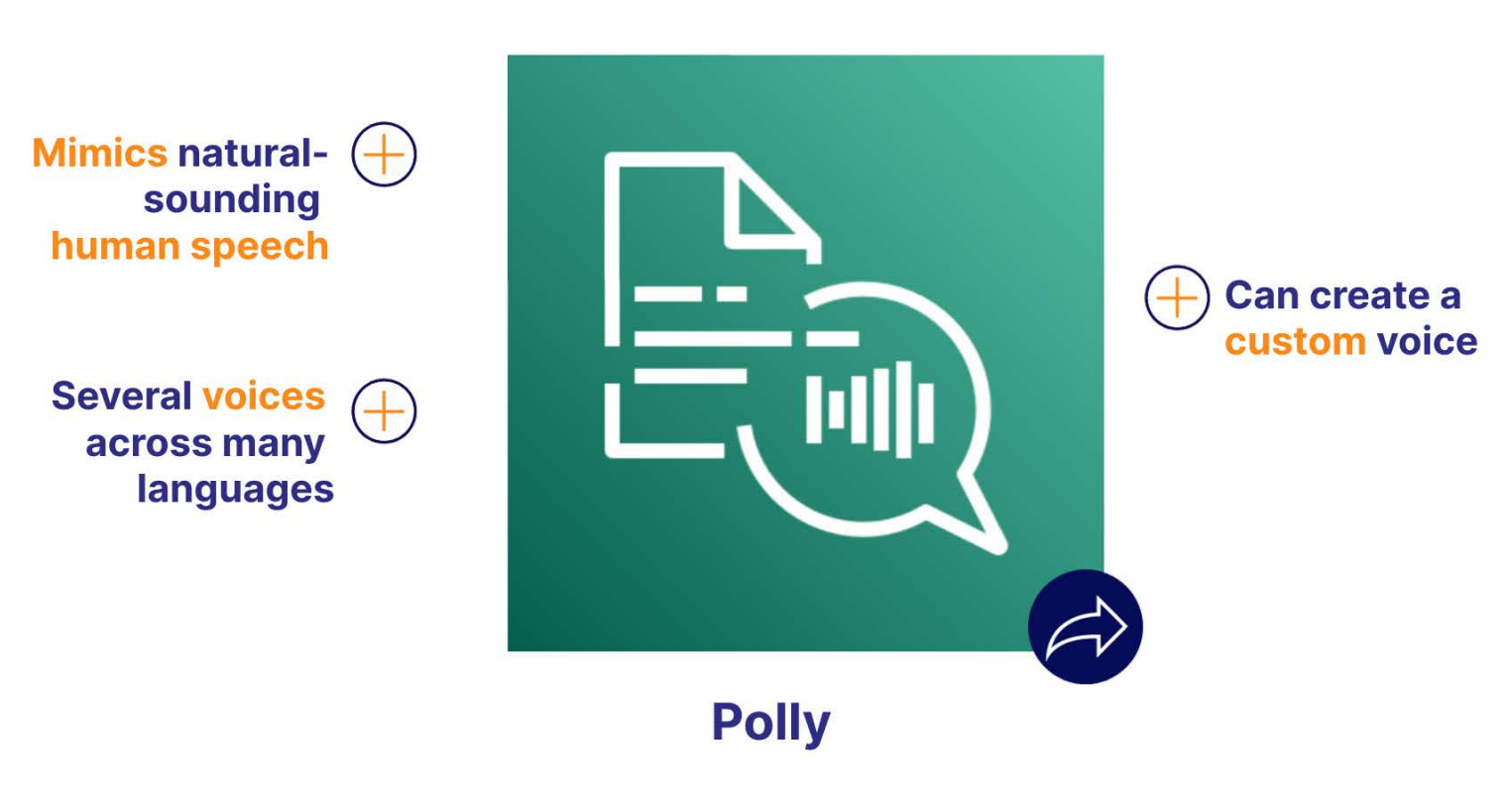
Review social media posts

Comprehend could help Alfredo process social media posts by looking for words that show customer sentiment about his pizza — words like delicious, tasty, cold, or bad taste. This is a great way to tell if his customers are happy.

POLLY

Polly

Polly turns text into speech.



Mimics natural-sounding human speech

Several voices across many languages

Can create a custom voice

Polly

Polly in the Real World

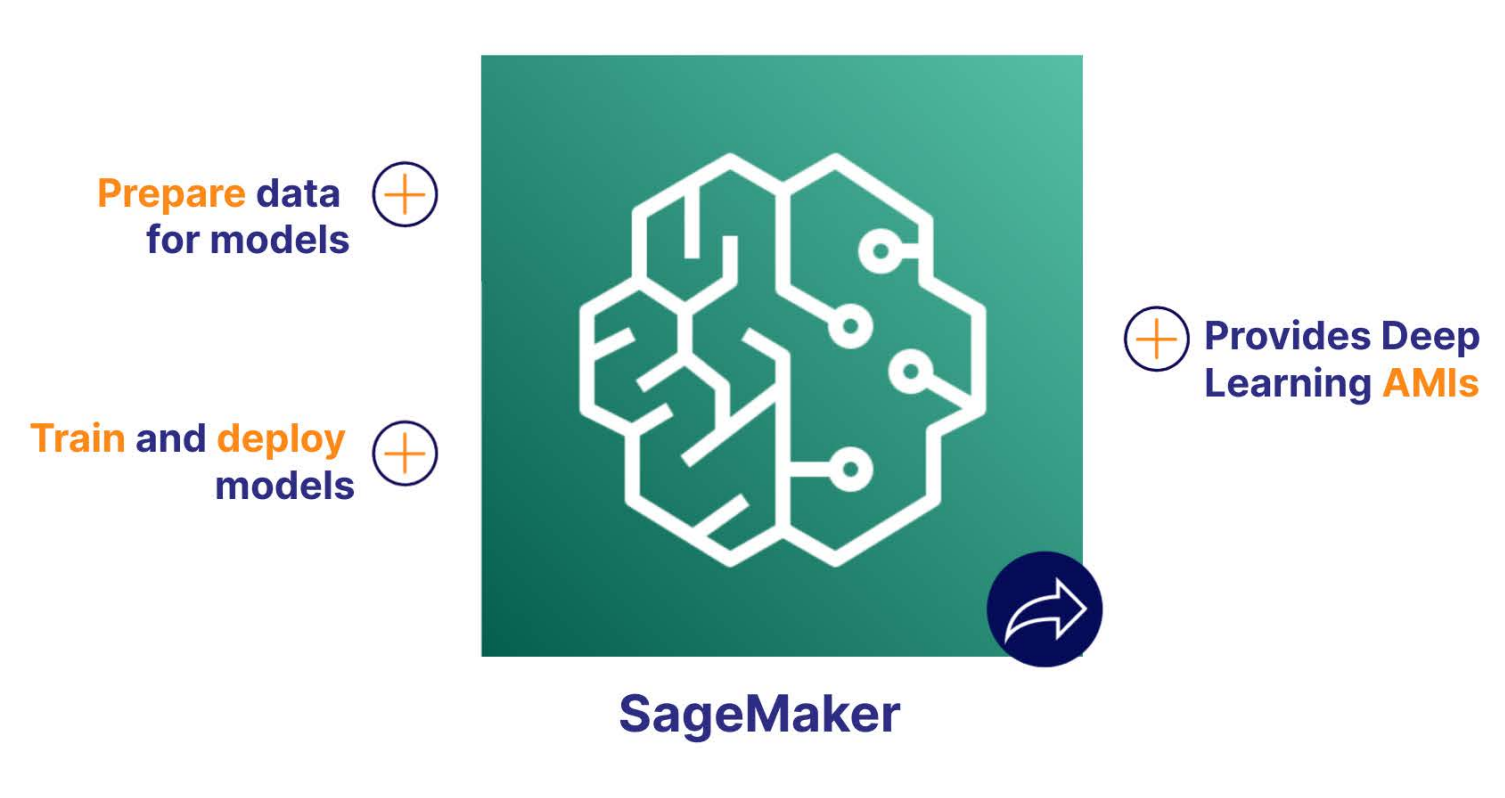
Add complementary audio

Polly could convert the text on a blog post to speech that could then be downloaded or replayed in MP3 format. Audio is often a great complement to written communication.

SAGEMAKER

SageMaker

SageMaker helps you build, train, and deploy machine learning models quickly.



Prepare data for models

Train and deploy models

Provides Deep Learning AMIs

SageMaker

SageMaker in the Real World

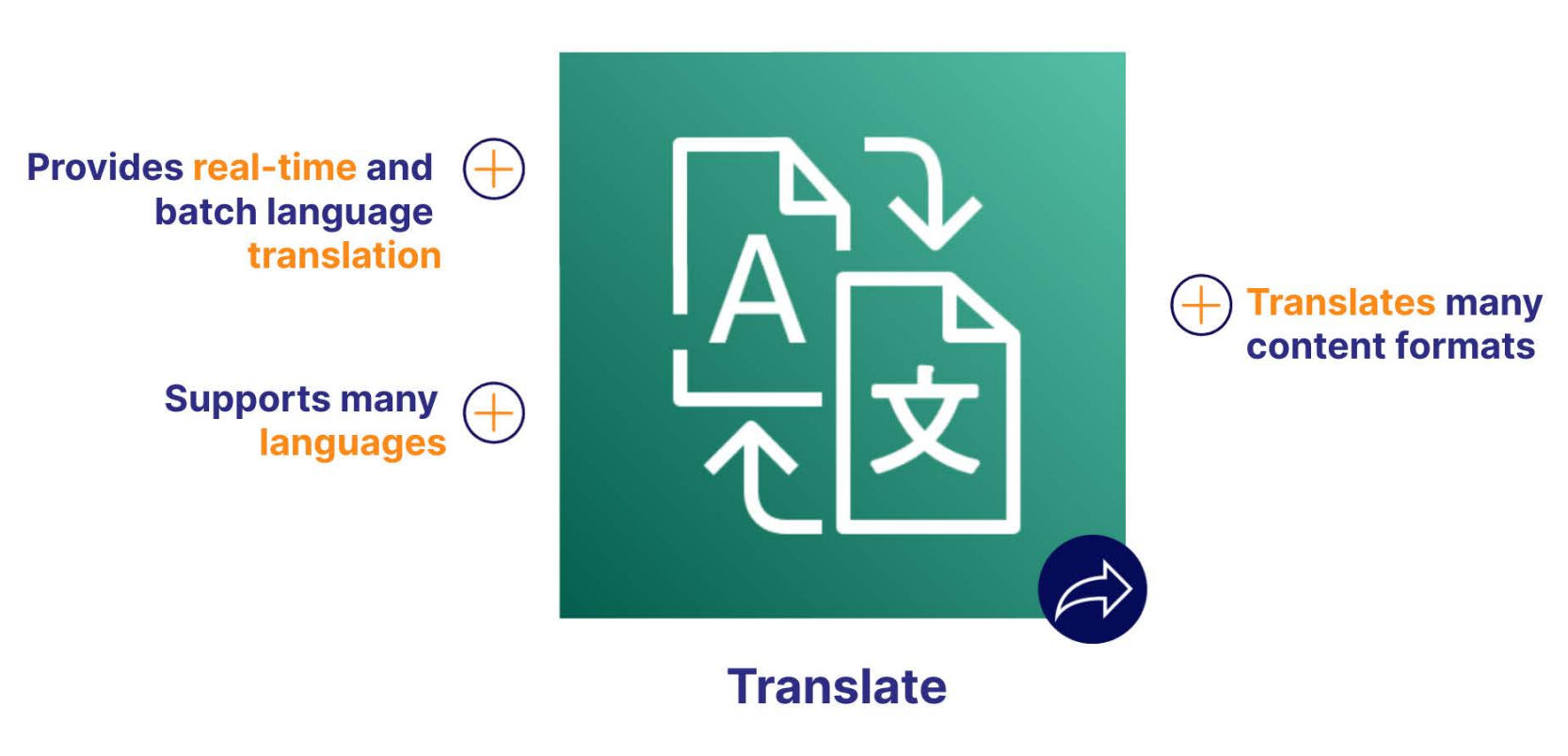
Recommendation engine

Companies like Netflix and Amazon use **machine learning models** to recommend movies and products to buy. SageMaker is a great tool for creating these models.

TRANSLATE

Translate

Translate provides language translation.



Provides real-time and batch language translation

Supports many languages

Translates many content formats

Translate

Translate in the Real World

Add localization to websites or applications

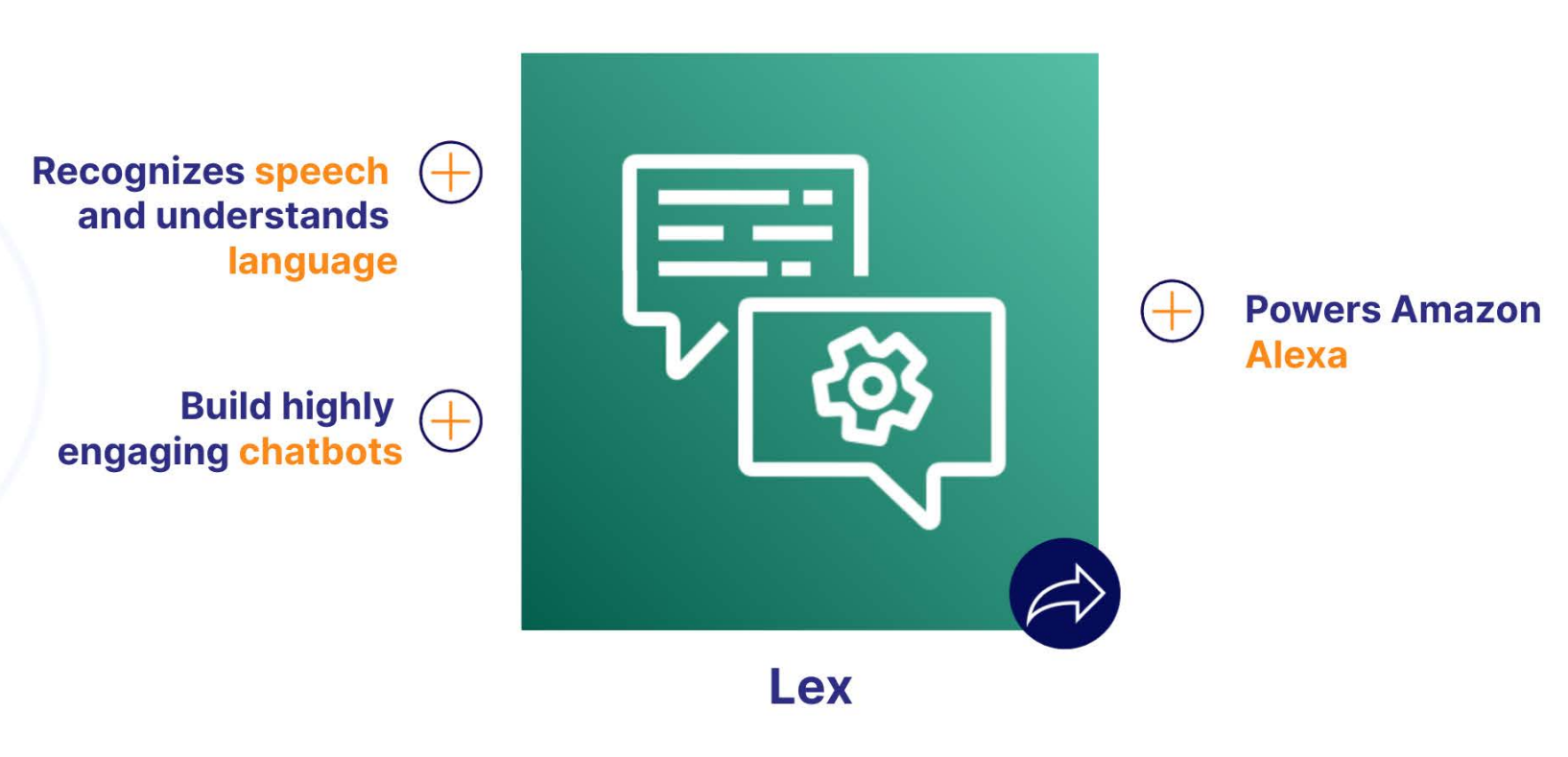
Hello Hola Ciao
Konnichiwa Nǐ hǎo

Translate allows you to add localization to your applications to support your diverse user base. Translate supports several popular languages.

LEX

Lex

Lex helps you build conversational interfaces like chatbots.



Recognizes speech and understands language

Build highly engaging chatbots

Powers Amazon Alexa

Lex

Lex in the Real World

Integrate voice into a device

Amazon used the same technologies that power **Lex** to integrate Amazon Alexa with the Echo device.

Review Time!

Rekognition	Comprehend	Polly
SageMaker	Translate	Lex

Rekognition

Rekognition allows you to automate your image and video analysis.

Polly

Polly turns text into speech.

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Comprehend is a natural-language processing (NLP) service that finds relationships in text.

SageMaker

SageMaker helps you build, train, and deploy machine learning models quickly.

Lex

Lex helps you build conversational interfaces like chatbots.

Translate

Translate provides language translation.

Hello Ciao Nǐ hǎo
Hola Namaste Bonjour
Konnichiwa

Things to Remember When Studying for the Exam

☑ **Comprehend**

Don't forget Comprehend is used for natural language processing (NLP).

☑ **Rekognition**

Don't forget Rekognition processes videos and images.

Join us for the next lesson!

A CLOUD GURU

Understanding Developer Tools

AWS CERTIFIED CLOUD PRACTITIONER

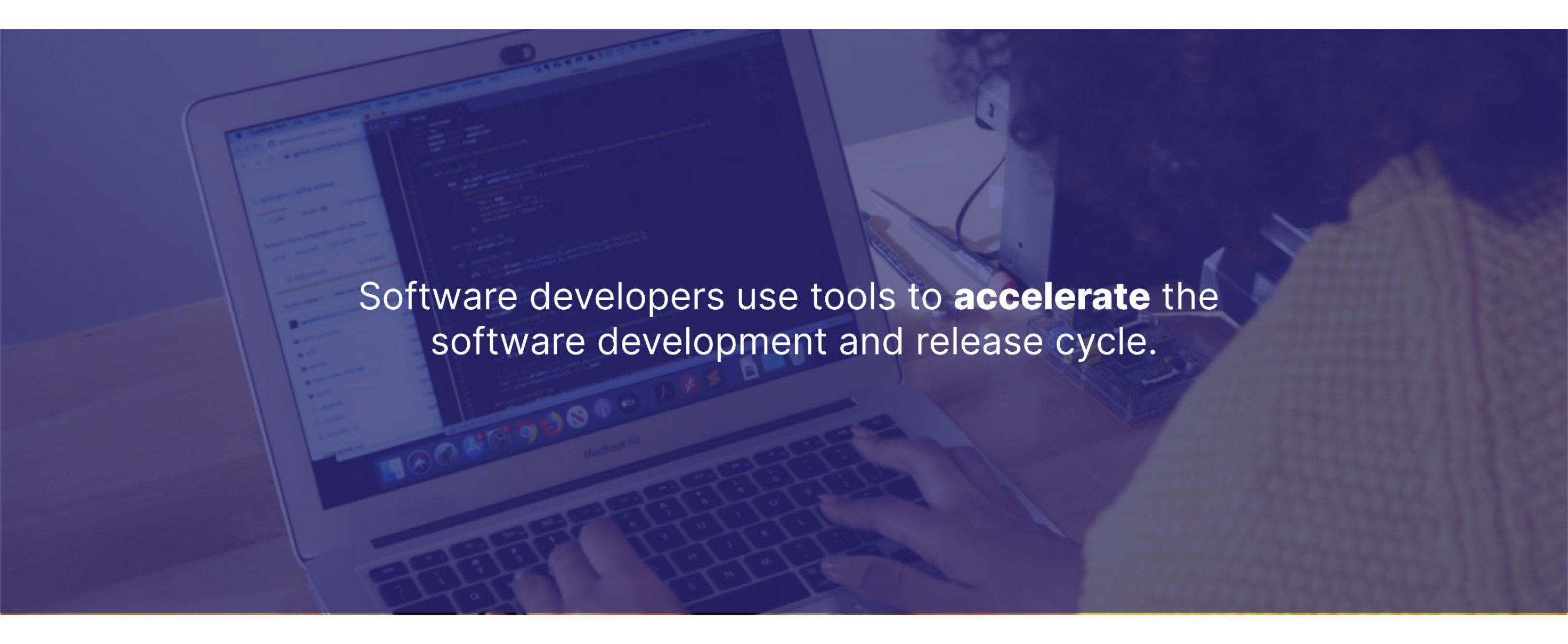
LESSON BREAKDOWN

1. Cloud9
2. CodeCommit
3. CodeBuild
4. CodeDeploy
5. CodePipeline
6. X-Ray
7. Review

GET STARTED

The Bigger Picture

Let's discuss why **developer** tools are important.



Software developers use tools to **accelerate** the software development and release cycle.

CLOUD9

Cloud9

Cloud9 allows you to write code within an integrated development environment (**IDE**) from within your web browser.

Integrated development environment (IDE)

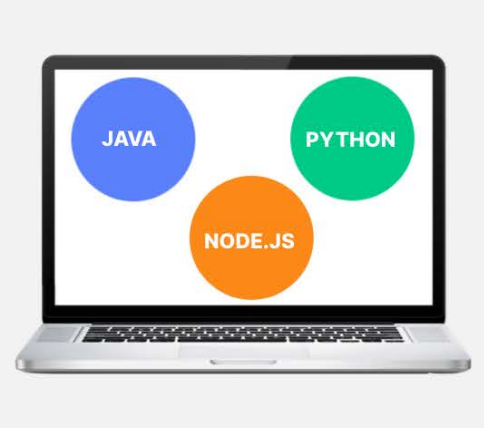
Write and debug code

Supports popular programming languages

Cloud9

Cloud9 in the Real World

Build serverless applications

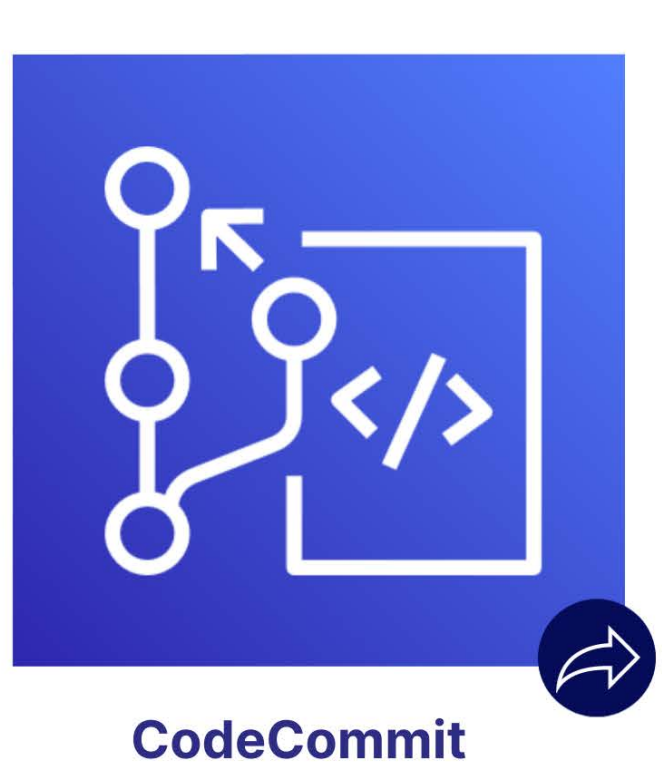


Cloud9 preconfigures the development environment with the needed SDKs and libraries. You can easily write the code for your Lambda function directly in your web browser.

CODECOMMIT

CodeCommit

CodeCommit is a source control system for private Git repositories.



Create repositories to store code

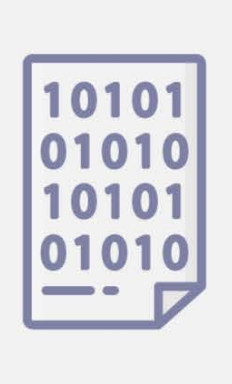
Commit, branch, and merge code

Collaborate with other software developers

CodeCommit

CodeCommit in the Real World

Manage versions of source code files for your applications

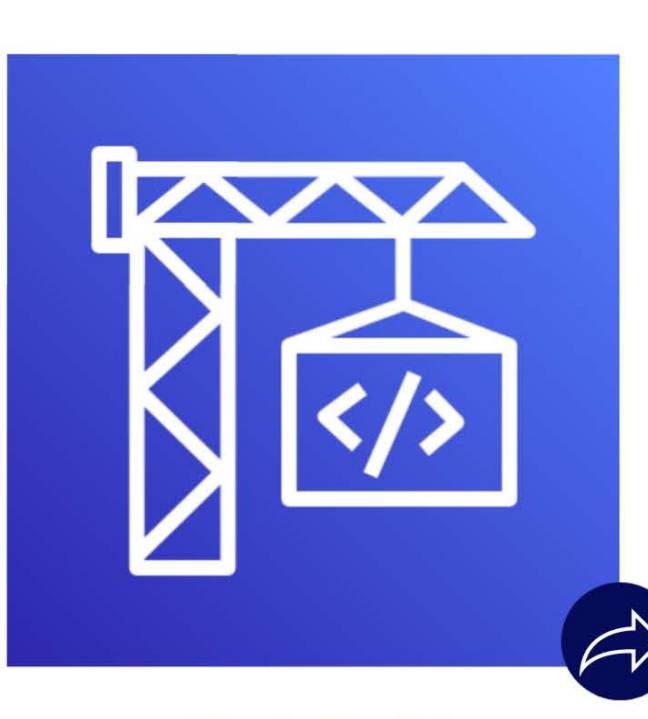


CodeCommit can be used to manage source code and the different versions of application files. CodeCommit is similar to GitHub.

CODEBUILD

CodeBuild

CodeBuild allows you to build and test your application source code.



Compiles source code and runs tests

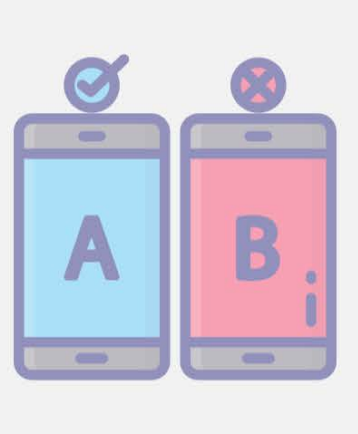
Enables continuous integration and delivery

Produces build artifacts ready to be deployed

CodeBuild

CodeBuild in the Real World

Run tests before deploying a new version of an application to production

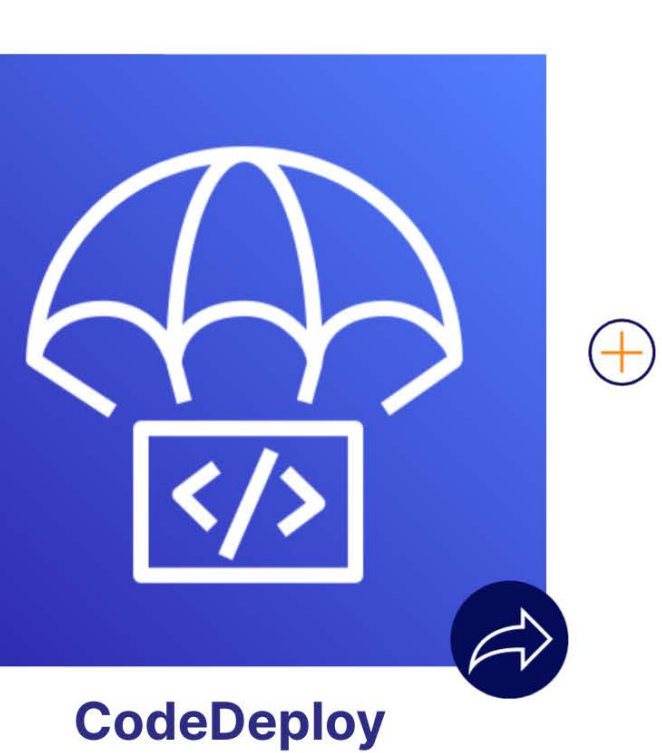


CodeBuild allows you to run as many parallel streams of tests as needed, allowing you to deploy your changes to production more quickly.

CODEDEPLOY

CodeDeploy

CodeDeploy manages the deployment of code to compute services in the cloud or on-premises.



Deploys code to EC2, Fargate, Lambda, and on-premises.

Maintains application uptime

CodeDeploy

CodeDeploy in the Real World

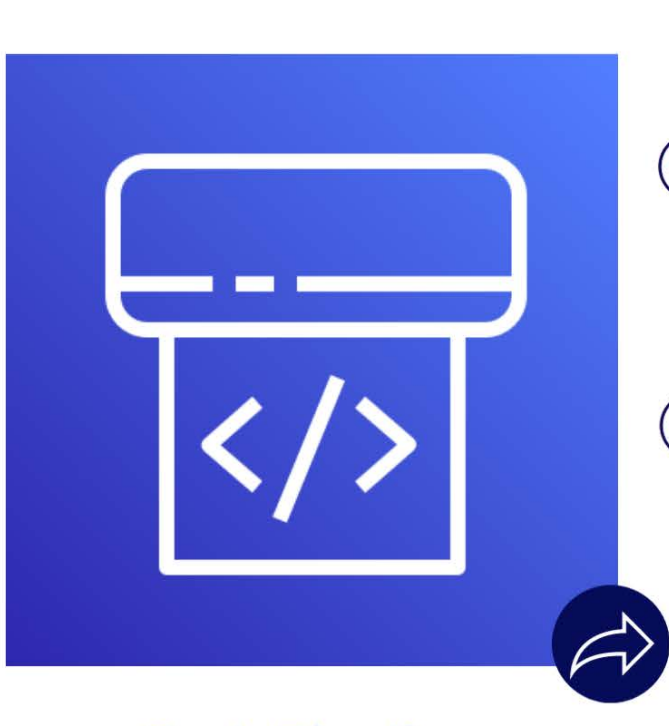
Maintain application uptime when rolling out a new version

CodeDeploy eliminates the downtime of your application when deploying a new version due to its rolling deployments.

CODEPIPELINE

CodePipeline

CodePipeline automates the software release process.



Quickly deliver new features and updates

Integrates with CodeBuild to run builds and unit tests

Integrates with CodeCommit to retrieve source code

Integrates with CodeDeploy to deploy your changes

CodePipeline

CodePipeline in the Real World

Add automation to the building, testing, and deployment of your application

DEV → TEST → PROD

When combined with other developer tools, **CodePipeline** helps development teams implement DevOps practices that automate testing and the movement of code to production.

X-RAY

X-Ray

X-Ray helps you debug production applications.

Analyze and debug production applications

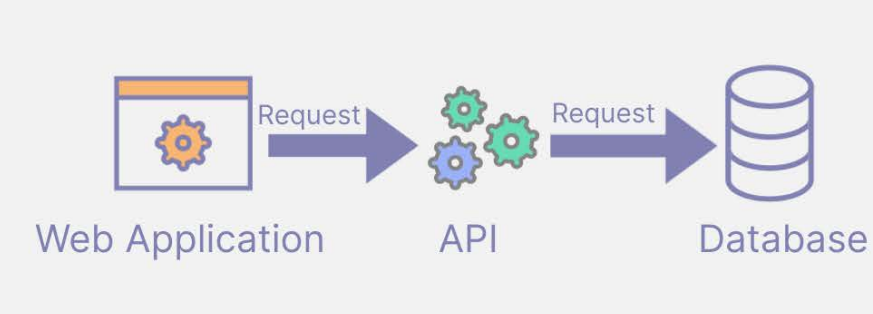
Map application components

View requests end to end

X-Ray

X-Ray in the Real World

Trace calls to an RDS database



X-Ray can help you map requests made to your RDS database from within your application. You can track information about the SQL queries generated and more.

Review Time!

Cloud9 | CodeCommit | CodeBuild

CodeDeploy | CodePipeline | X-Ray

Cloud9

Cloud9 allows you to write code within an integrated development environment (IDE) from within your web browser.

CodeCommit

CodeCommit is a source control system for private Git repositories.

CodeBuild

CodeBuild allows you to build and test your application source code.

CodeDeploy

CodeDeploy manages the deployment of code to compute services in the cloud or on-premises.

CodePipeline

CodePipeline automates the software release process.

DEV → TEST → PROD

X-Ray

X-Ray helps you debug production applications.

Things to Remember When Studying for the Exam

- ☑ **CodeCommit**
  Don't forget CodeCommit offers a service similar to GitHub that works with Git repositories.
- ☑ **CodeDeploy**
  Remember that CodeDeploy allows you to deploy an application to servers running on-premises and in the cloud.
- ☑ **Cloud9**
  Don't forget Cloud9 offers an integrated development environment (IDE) that runs inside a web browser.
- ☑ **CodePipeline**
  Don't forget CodePipeline allows you to implement a CI/CD pipeline.

Join us for the next lesson!

A CLOUD GURU

Exploring Deployment and Infrastructure Management Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. CloudFormation
2. Elastic Beanstalk
3. OpsWorks
4. Review

GET STARTED

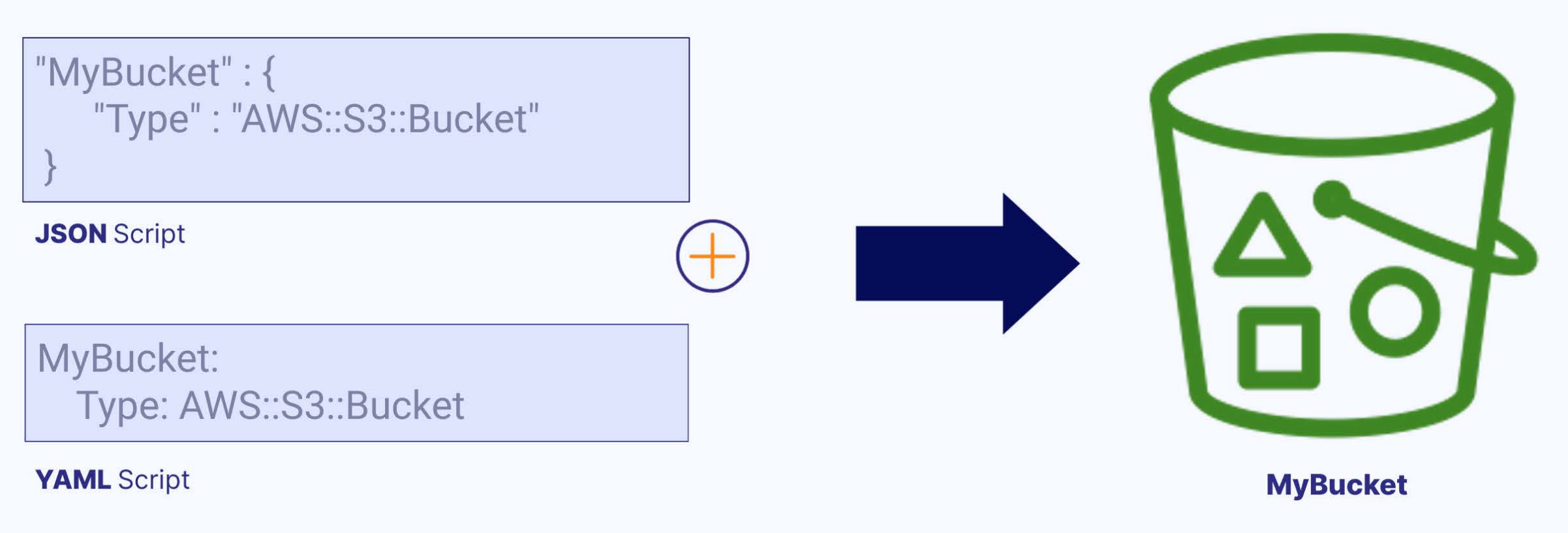
The Bigger Picture

Let's discuss the benefits of **deployment** and **IT infrastructure management** services.

These services help you quickly stand up new applications, automate the management of infrastructure, and provide real-time visibility into system health.

Have you heard of Infrastructure as Code (IaC)?

IaC allows you to write a **script** to provision AWS resources. The benefit is that you provision resources in a **reproducible** manner that saves time.



```
"MyBucket" : {
    "Type" : "AWS::S3::Bucket"
}
```

JSON Script

```
MyBucket:
  Type: AWS::S3::Bucket
```

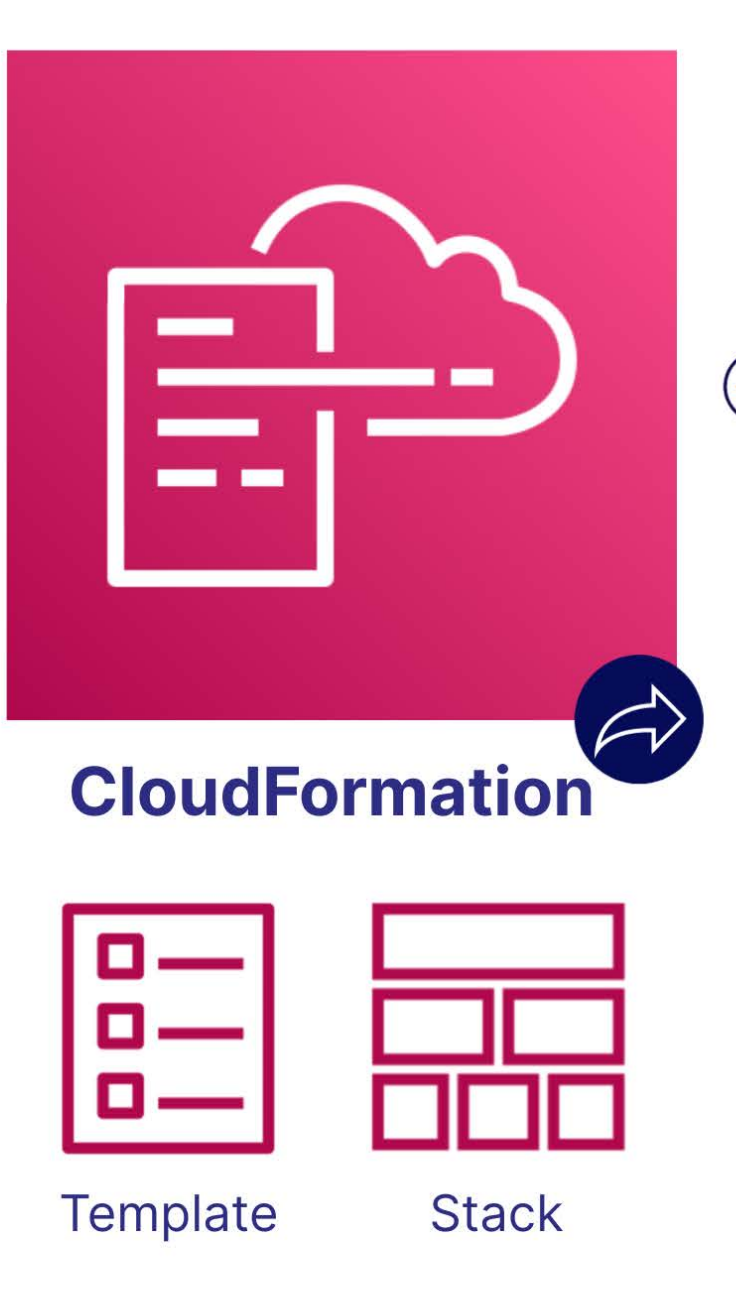
YAML Script

> There's no need to use the **S3 Management Console** to create a bucket.

CLOUDFORMATION

CloudFormation

CloudFormation allows you to provision AWS resources using Infrastructure as Code **(IaC)**.

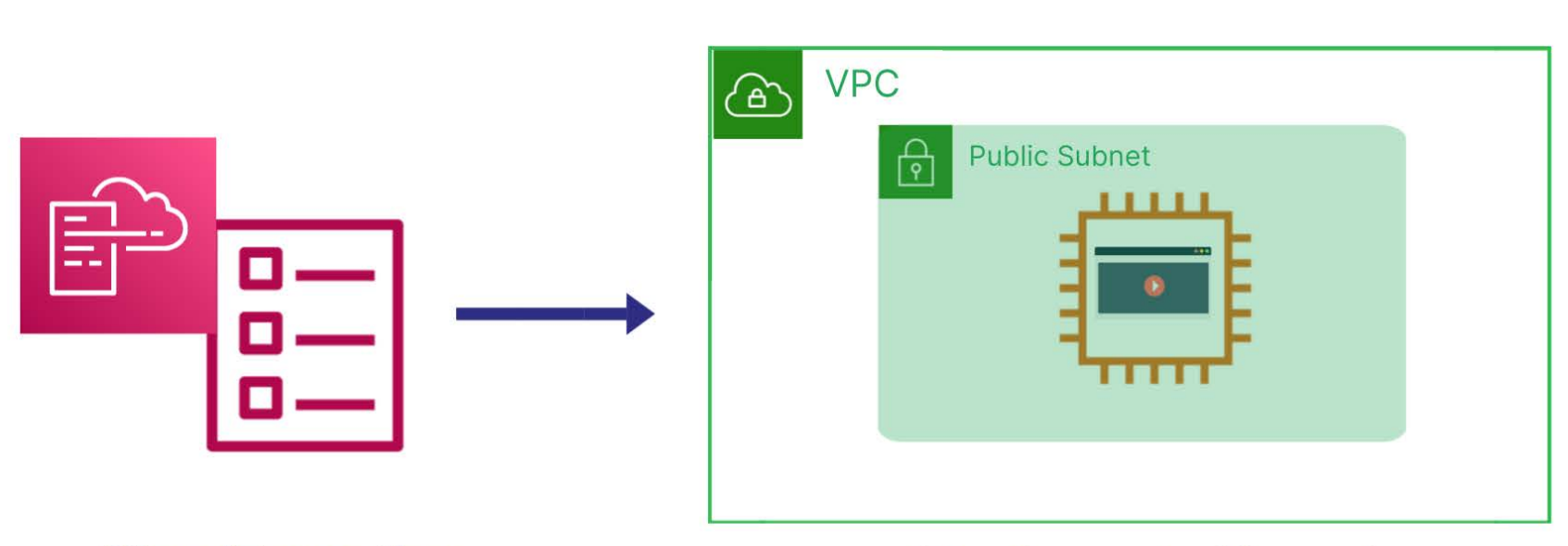


- Provides a repeatable process for provisioning resources
- Works with most AWS services
- Create templates for the resources you want to provision

CloudFormation in the Real World

Automate the infrastructure-provisioning process for EC2 servers.

You can use CloudFormation to automate the creation of EC2 instances in your AWS account.



CloudFormation Template

Stack created based on template

ELASTIC BEANSTALK

Elastic Beanstalk

Elastic Beanstalk allows you to deploy your web applications and web services to **AWS**.

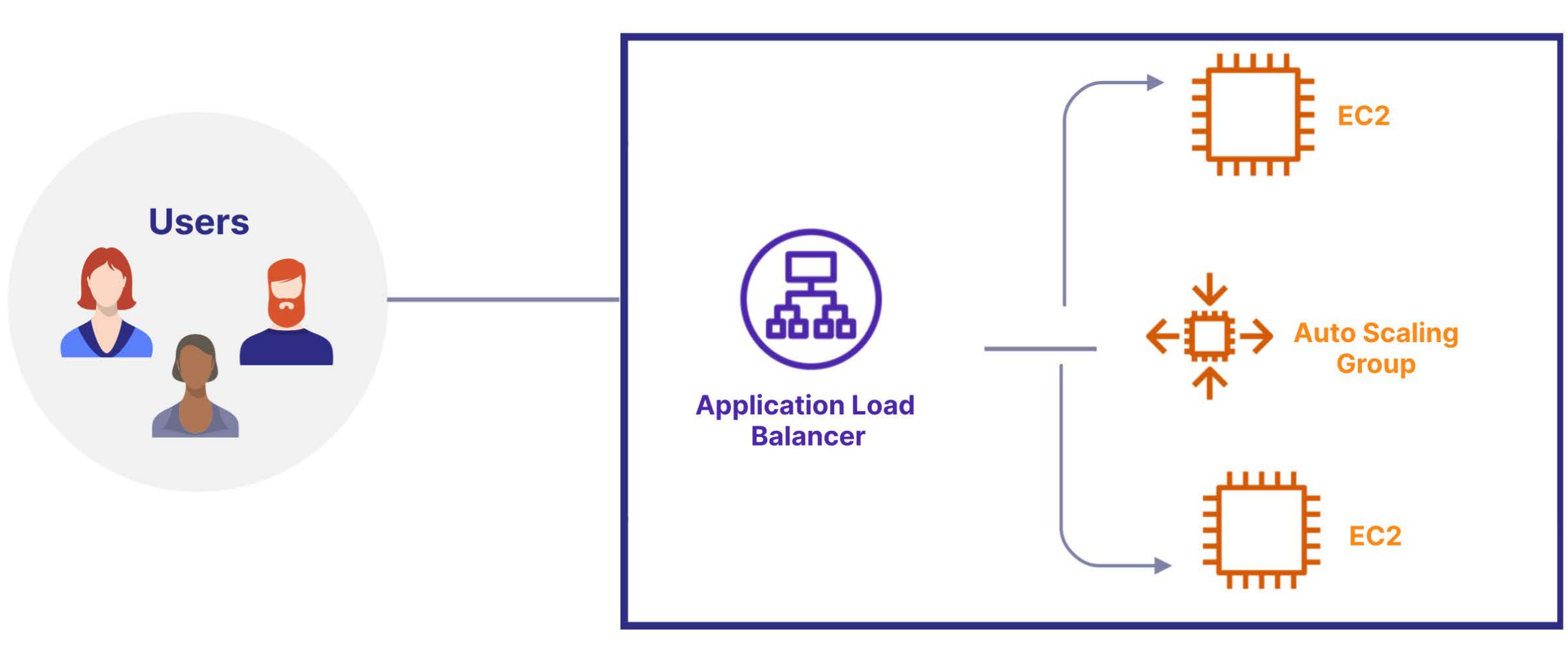
In reality, Elastic Beanstalk is a compute service, but it's used when you're ready to deploy your application.

- Orchestration service that provisions resources
- Automatically handles the deployment
- Monitors application health via a health dashboard

Elastic Beanstalk in the Real World

Quickly deploy a scalable Java-based web application to AWS.

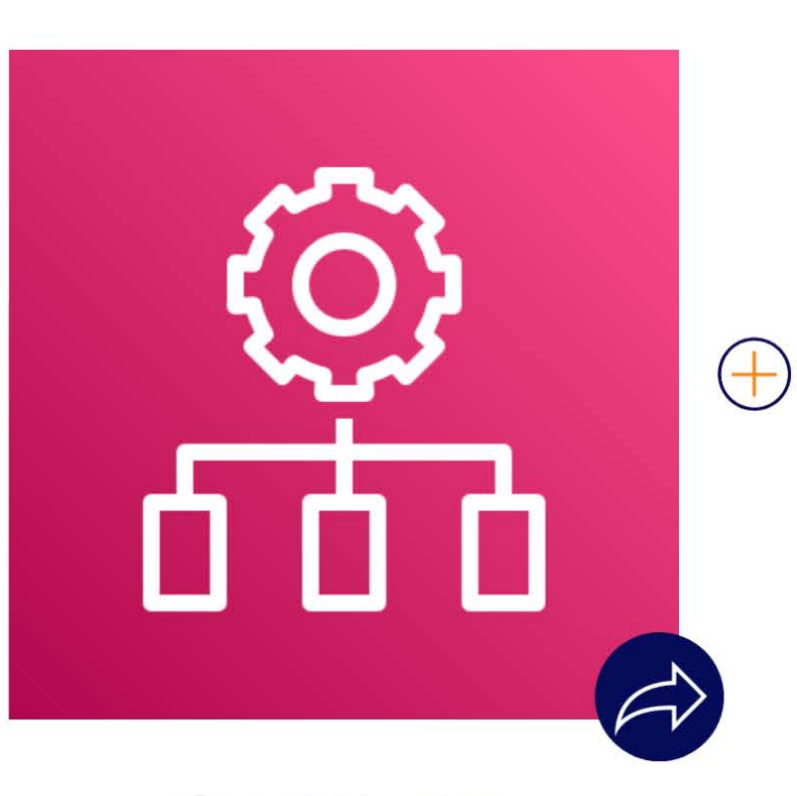
After you upload your Java code, Elastic Beanstalk deploys it and handles capacity provisioning, load balancing, and Auto Scaling. Elastic Beanstalk even monitors the health of your application.



OPSWORKS

OpsWorks

OpsWorks allows you to use **Chef** or **Puppet** to automate the configuration of your servers and deploy code.



- Deploy code and manage applications
- Manage on-premises servers or EC2 instances in AWS Cloud
- Works with Chef and Puppet automation platforms

CHEF Progress

puppet

OpsWorks in the Real World

Automate software configurations and infrastructure management for your application.

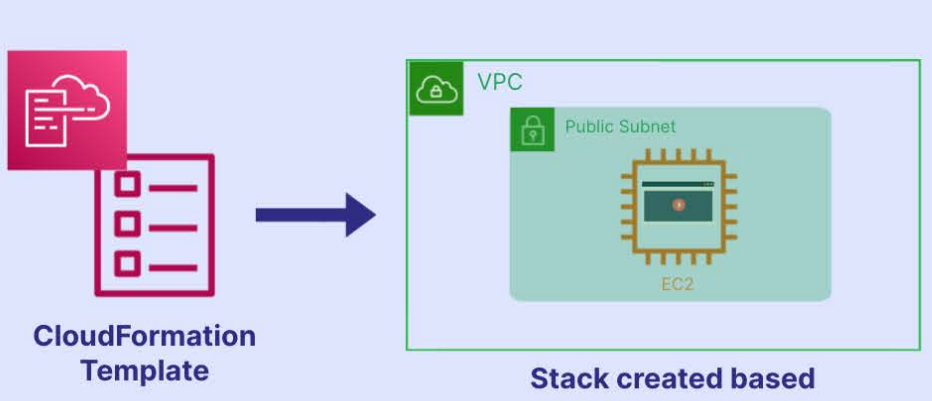
OpsWorks allows you to define software installation scripts and automate configuration for your application servers.

Review Time!

CloudFormation | Elastic Beanstalk | OpsWorks

CloudFormation

CloudFormation allows you to provision AWS resources using Infrastructure as Code (IaC).



OpsWorks

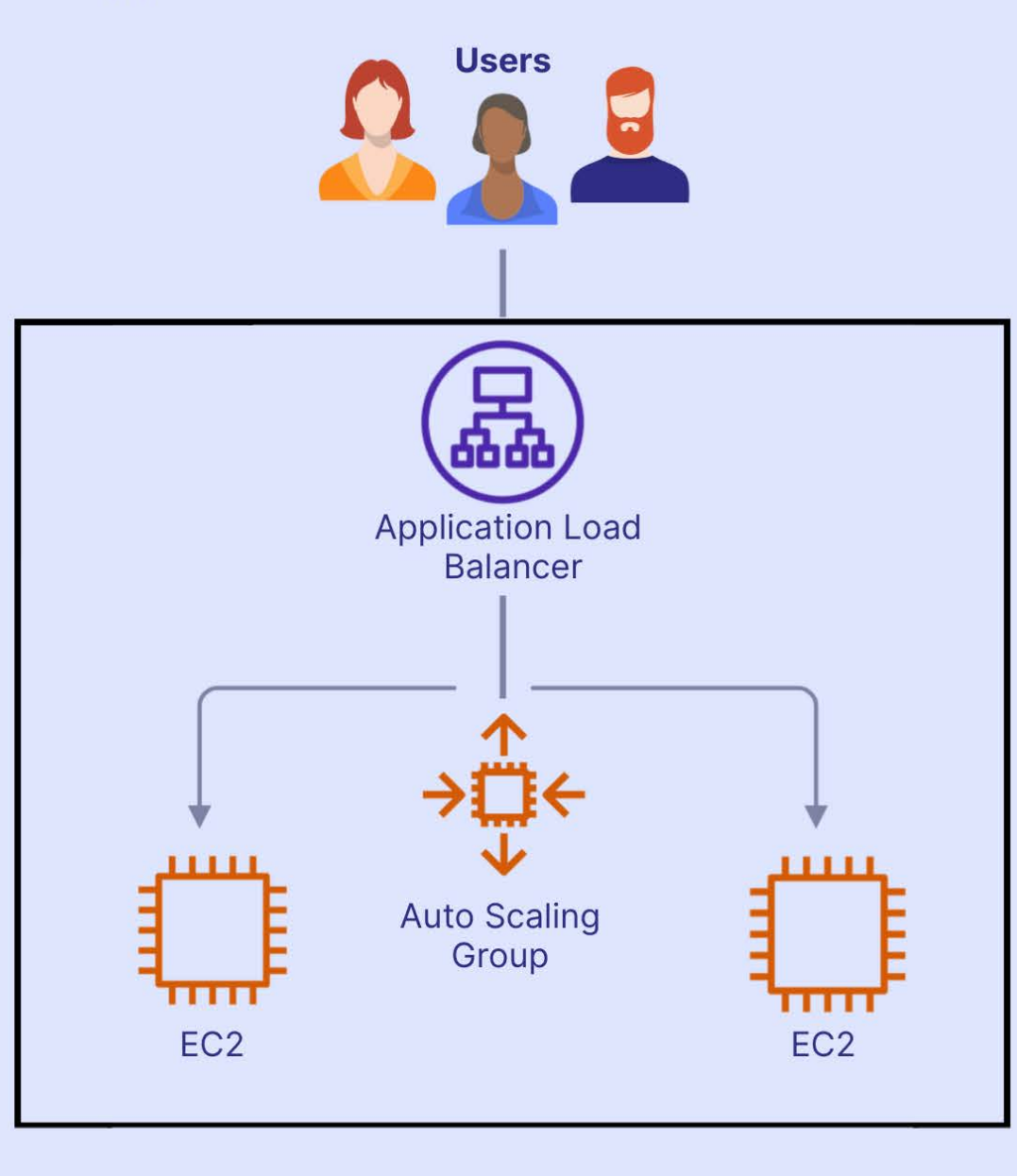
OpsWorks allows you to use **Chef or Puppet** to automate the configuration of your servers and deploy code.

CHEF Progress

puppet

Elastic Beanstalk

Elastic Beanstalk allows you to deploy your web applications and web services to AWS.



Things to Remember when Studying for the Exam

☑ **CloudFormation**

Don't forget CloudFormation supports infrastructure automation using Infrastructure as Code (IaC).

☑ **Elastic Beanstalk**

Don't forget Elastic Beanstalk is only used to deploy applications to the AWS Cloud — it is not used to deploy applications on-premises.

☑ **OpsWorks**

Remember that OpsWorks can deploy applications on-premises, and it also automates infrastructure management using Chef or Puppet.

Join us for the next lesson!

A CLOUD GURU

Utilizing Messaging and Integration Services: SQS

AWS CERTIFIED CLOUD PRACTITIONER

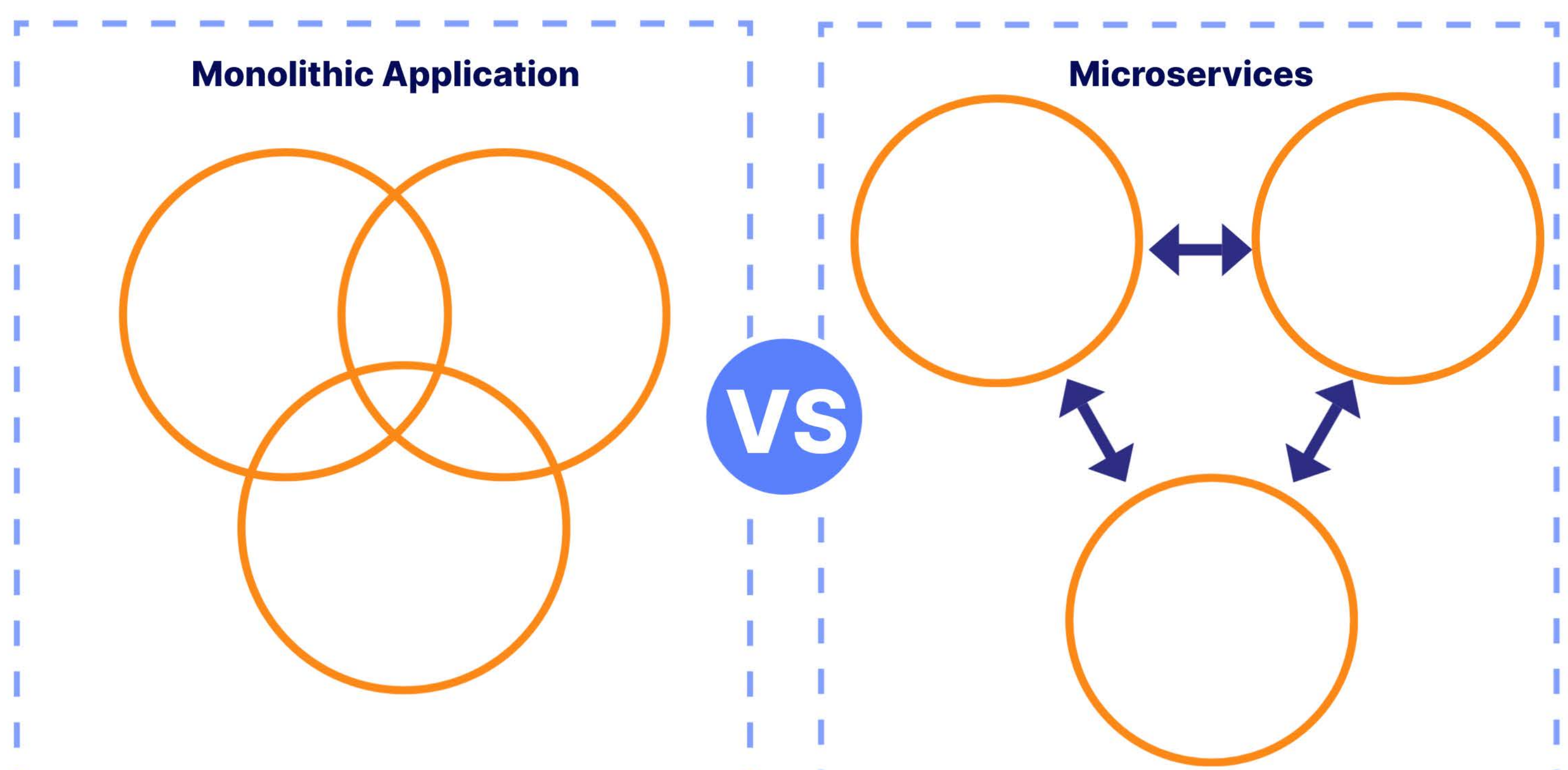
LESSON BREAKDOWN

1 Simple Queue Service (SQS)
2 Review

GET STARTED

Have you heard of loose coupling?

Coupling defines the interdependencies or connections between components of a system. **Loose coupling** helps reduce the risk of cascading failures between components.



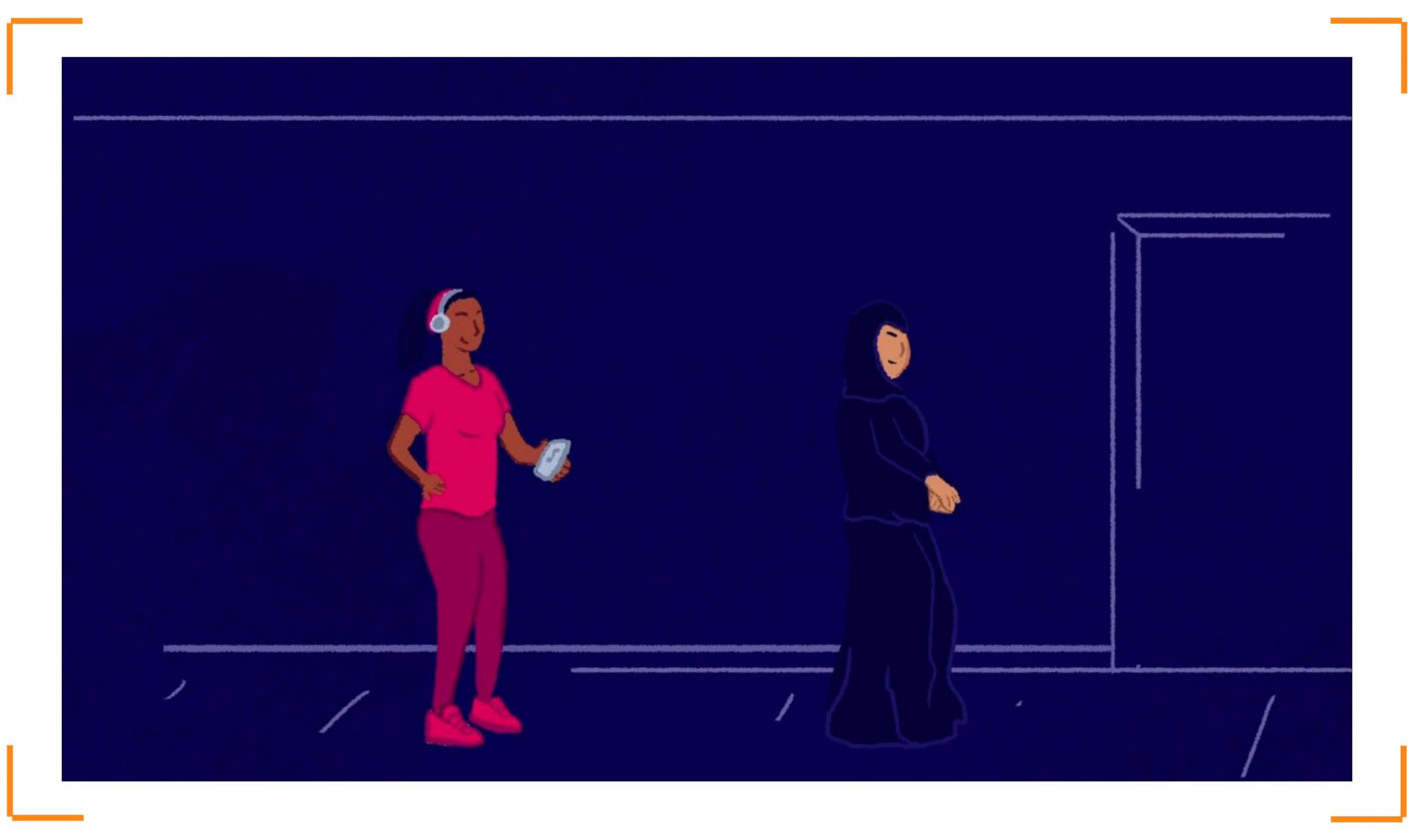
Tight coupling

Tightly coupled components are **highly dependent** on each other.

Loose coupling

Loosely coupled components are connected but **not dependent** on each other.

Queues are used to implement loosely coupled systems



SIMPLE QUEUE SERVICE

Simple Queue Service (SQS)

SQS is a message queuing service that allows you to build loosely coupled systems.

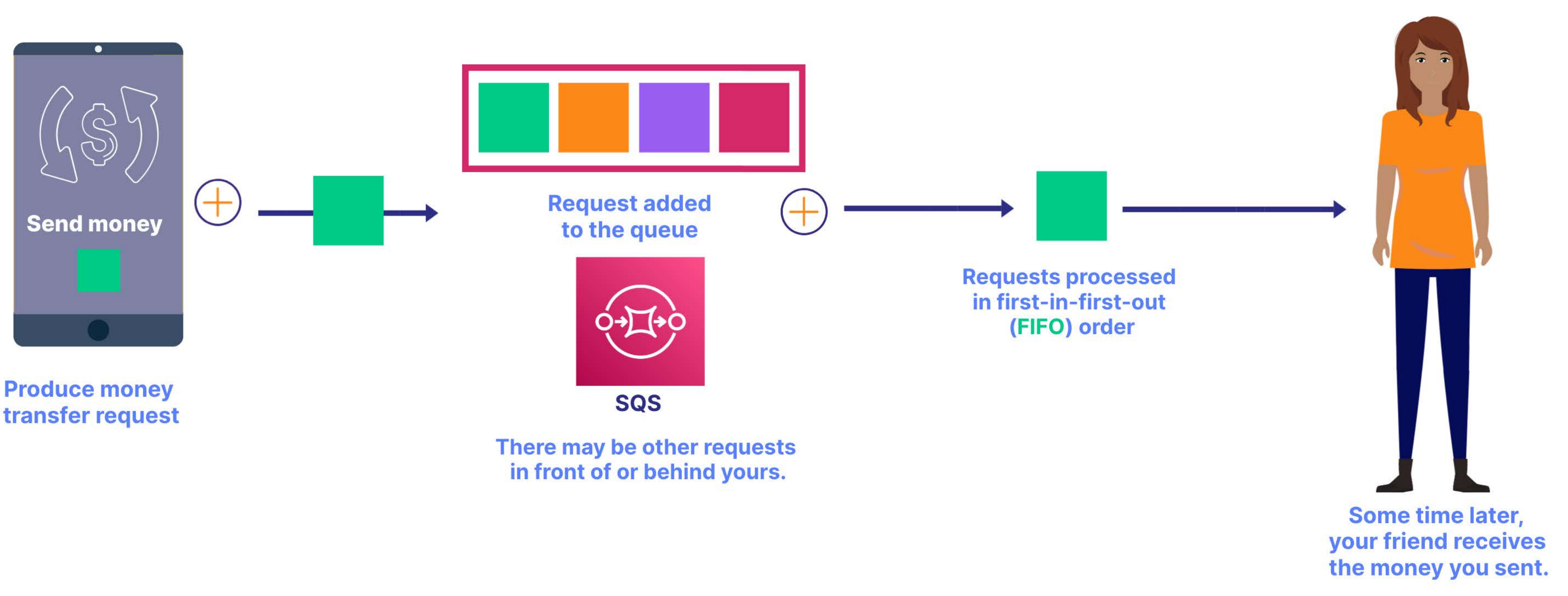
- **Allows component-to-component communication using messages**
- **Multiple components (or producers) can add messages to the queue**
- **Messages are processed in an asynchronous manner**

SQS

SQS in the Real World

Build a money transfer app that performs well under heavy load.

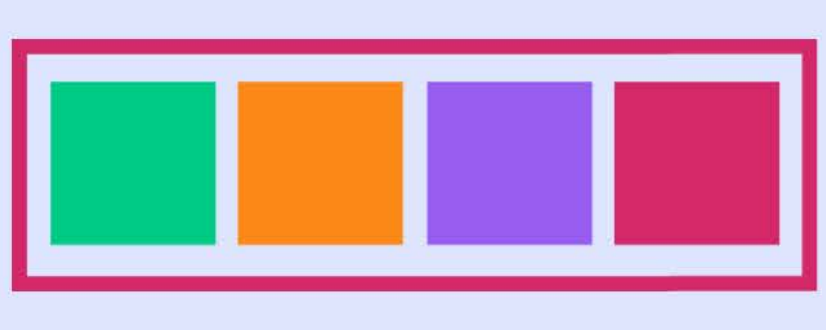
SQS lets you build an app that is loosely coupled, allowing components to send, store, and receive messages. The use of a messaging queue helps to improve performance and scalability.


Send money
Produce money transfer request
Request added to the queue
SQS
There may be other requests in front of or behind yours.
Requests processed in first-in-first-out (FIFO) order
Some time later, your friend receives the money you sent.

Review Time!

Simple Queue Service (SQS)

SQS is a message queuing service that allows you to build loosely coupled systems.



Things to Remember When Studying for the Exam

- ☑ **SQS** Don't forget messages in queues are processed in FIFO order.
- ☑ **SQS** Remember that message queues support loose coupling.

Join us for the next lesson!

A CLOUD GURU

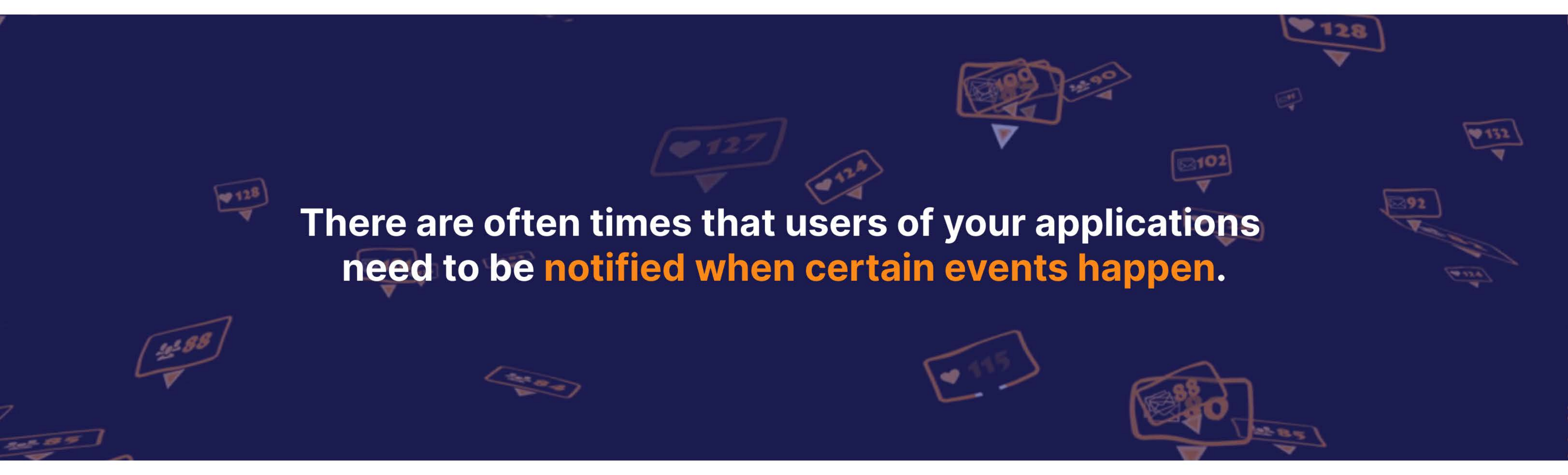
Utilizing Messaging and Integration Services: SNS and SES

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Simple Notification Service (SNS)
2. Simple Email Service (SES)
3. Review

GET STARTED

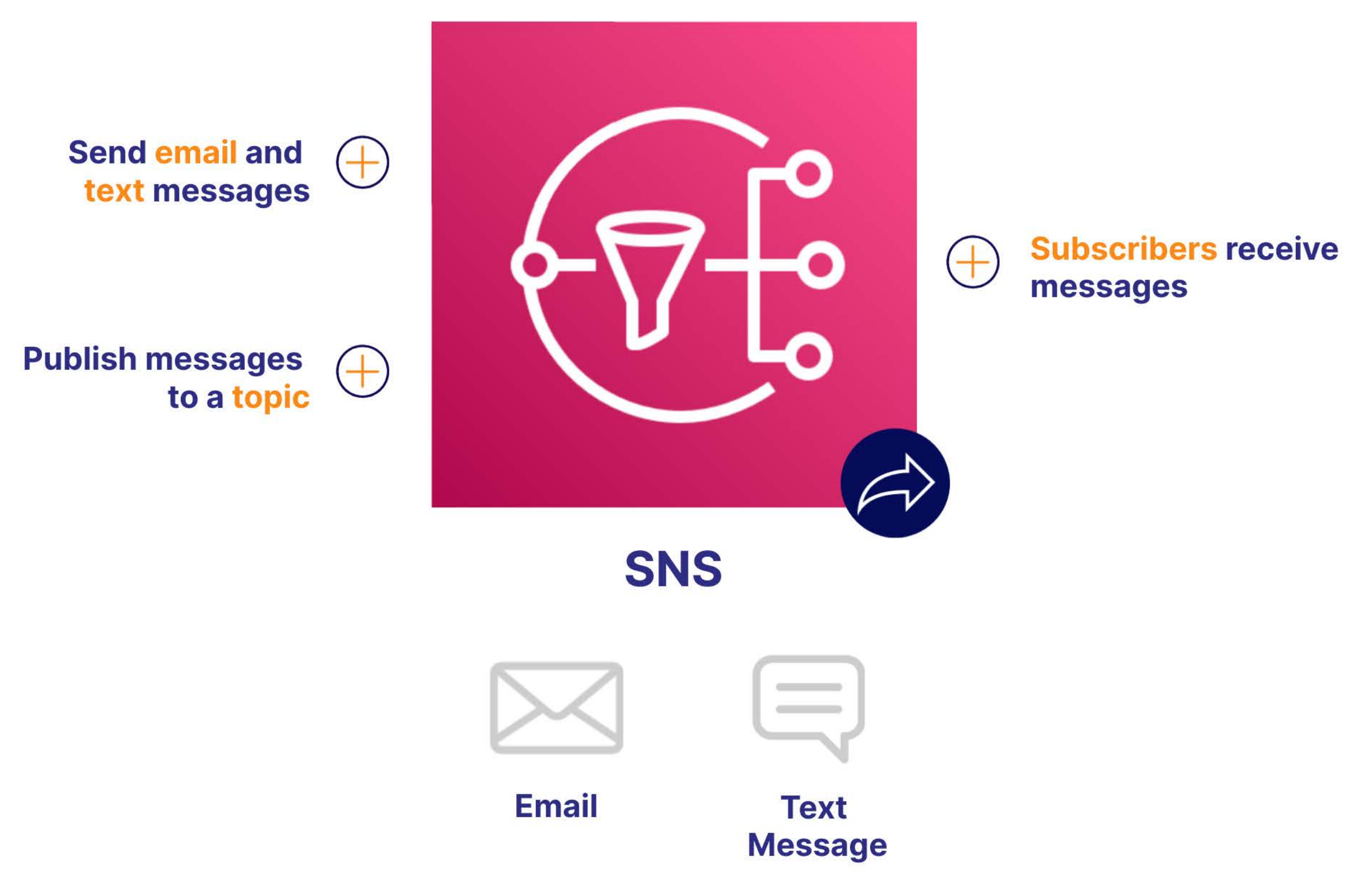


There are often times that users of your applications need to be **notified when certain events happen.**

SIMPLE NOTIFICATION SERVICE

Simple Notification Service (SNS)

SNS allows you to send emails and text messages from your applications.



Send email and text messages

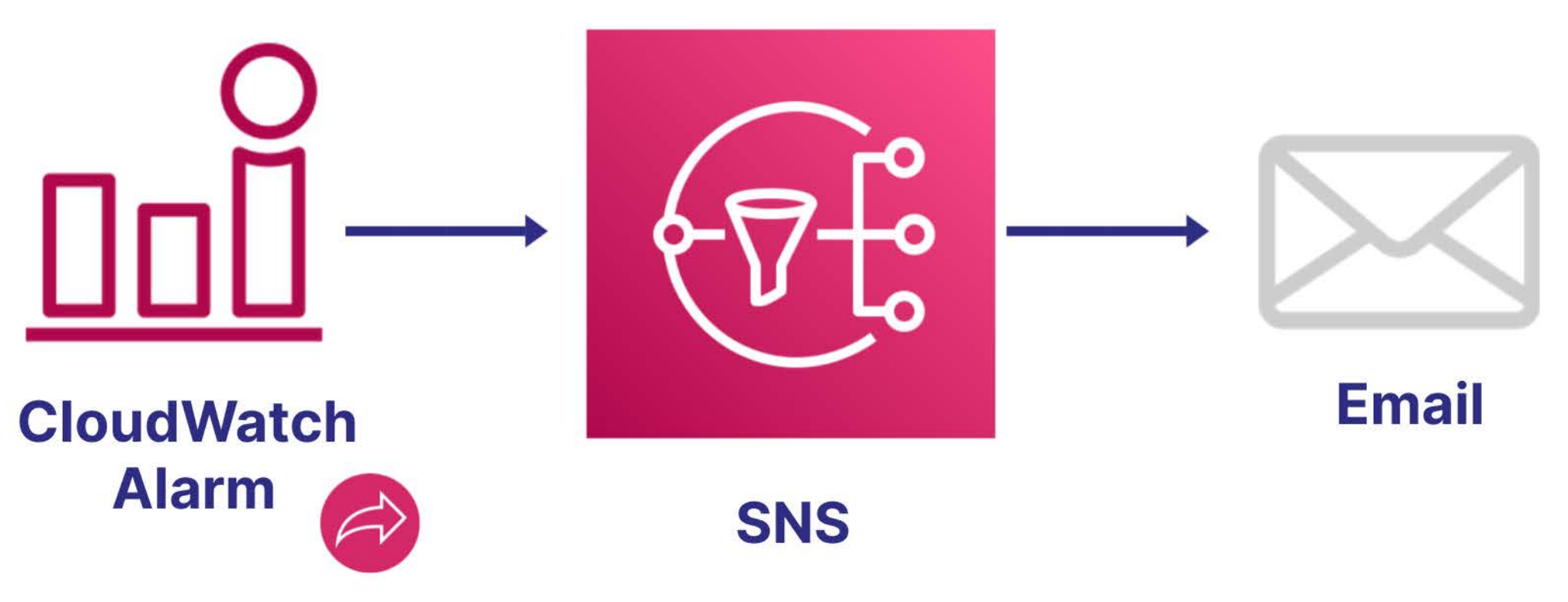
Publish messages to a topic

Subscribers receive messages

SNS in the Real World

Send an email when CPU utilization of an **EC2 instance goes above 80%.**

SNS works with CloudWatch when an alarm's metric threshold is breached to send an email.



SIMPLE EMAIL SERVICE

Simple Email Service (SES)

SES is an email service that allows you to send richly formatted HTML emails from your applications.

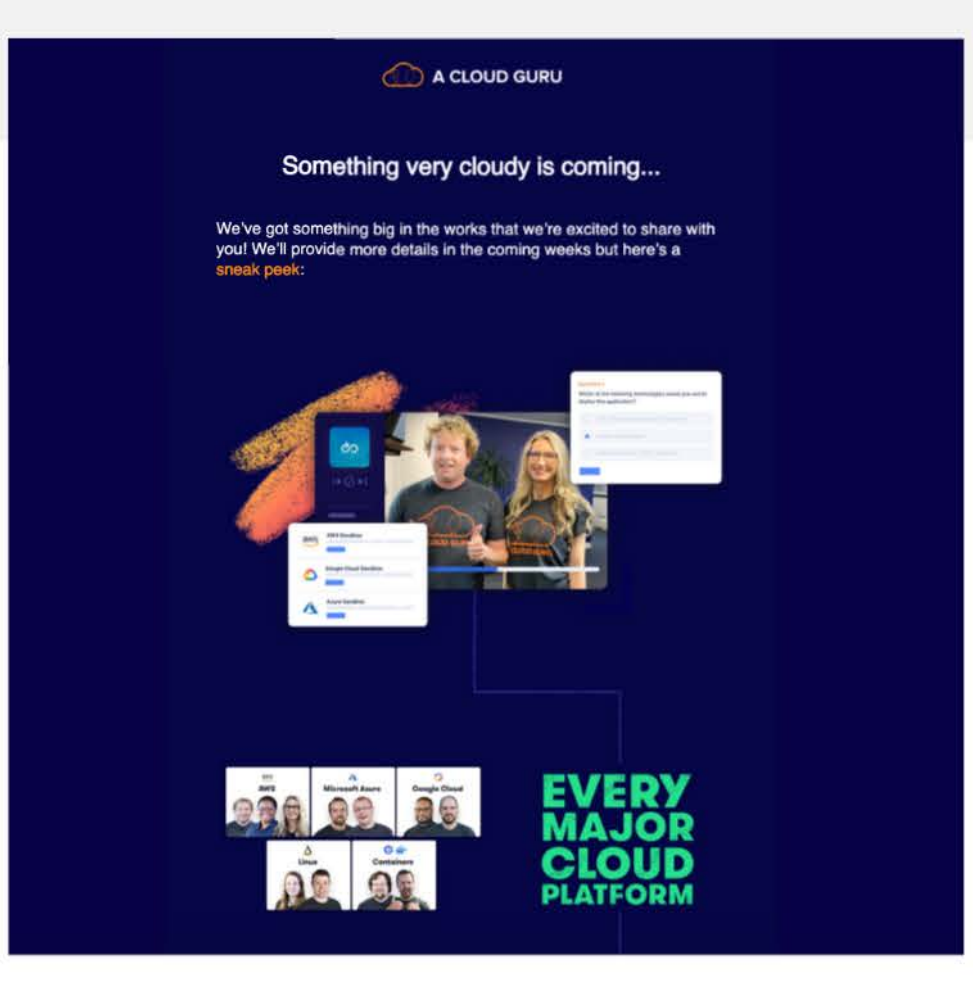
Ideal choice for marketing campaigns or professional emails

Unlike SNS, SES sends HTML emails

SES in the Real World

Send a marketing email and track open or click-through rates.

SES allows you to send richly formatted HTML emails in bulk and gain valuable insights about the effectiveness of your campaign.



A CLOUD GURU

Something very cloudy is coming...

We've got something big in the works that we're excited to share with you! We'll provide more details in the coming weeks but here's a sneak peek:

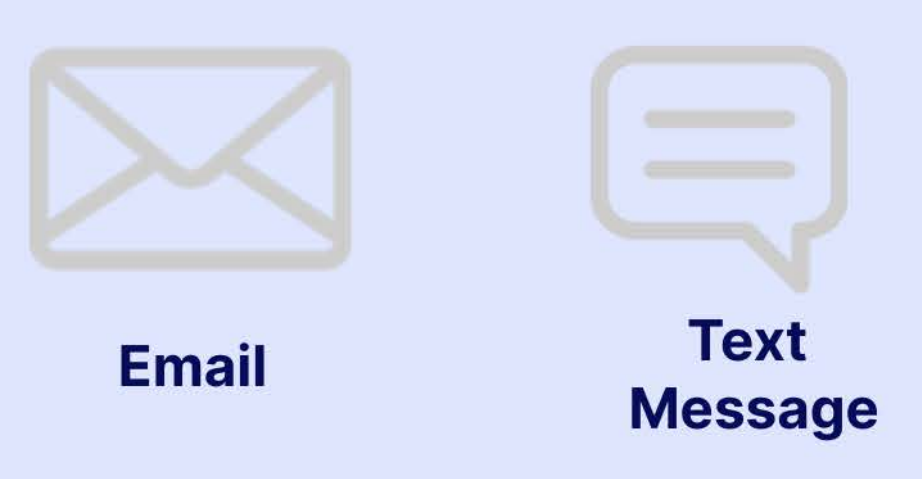
EVERY MAJOR CLOUD PLATFORM

Review Time!

SNS | SES

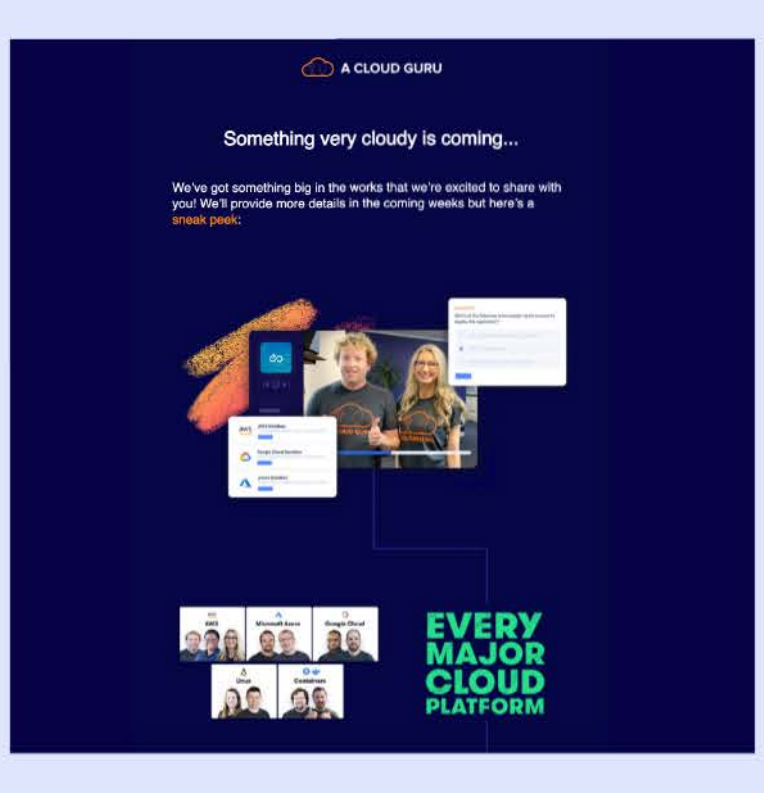
Simple Notification Service (SNS)

SNS allows you to send emails and text messages from your applications.



Simple Email Service (SES)

SES is an email service that allows you to send richly formatted HTML emails from your applications.



A CLOUD GURU

Something very cloudy is coming...

We've got something big in the works that we're excited to share with you! We'll provide more details in the coming weeks but here's a sneak peek:

EVERY MAJOR CLOUD PLATFORM

Things to Remember When Studying for the Exam

☑ **SNS**

Don't forget SNS sends text messages and plain text emails.

☑ **SES**

Remember that SES sends HTML-formatted emails for marketing campaigns.

Join us for the next lesson!

A CLOUD GURU

Exploring Auditing, Monitoring, and Logging Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. CloudWatch
2. CloudTrail
3. Review

GET STARTED

The Bigger Picture

Let's discuss how **auditing, monitoring, and logging** fit in the bigger picture.

These services give you **insight** into how well your systems are **performing** and help you **proactively** find and resolve **errors**.

Questions

You can answer many questions using auditing, monitoring, and logging services on AWS.

1. **Who signed in and made changes via the AWS Management Console?**
2. **What is the current load on this EC2 instance?**
3. **What is the root cause of this application error?**
4. **Which execution path resulted in this error?**

CLOUDWATCH

CloudWatch

CloudWatch is a collection of services that help you monitor and observe your cloud resources.

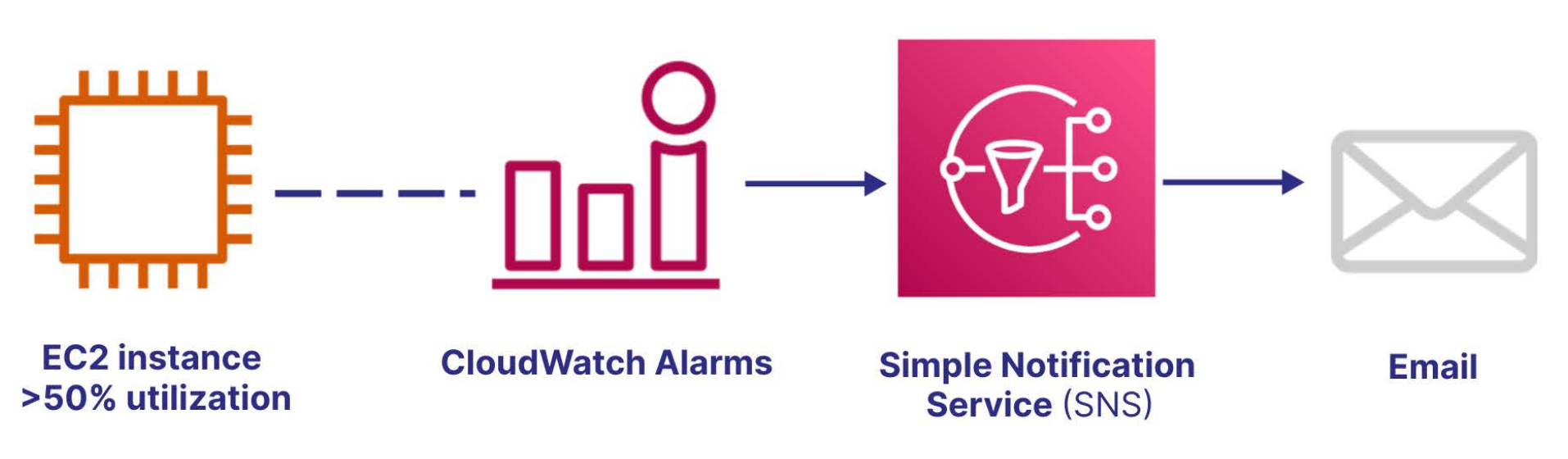
- **Collects metrics, logs, and events**
- **Detect anomalies in your environment**
- **Set alarms**
- **Visualize logs**

CloudWatch Alarms	CloudWatch Logs	CloudWatch Metrics	CloudWatch Events
Set high resolution alarms	Monitor application logs	Visualize time-series data	Trigger an event based on a condition

CloudWatch in the Real World

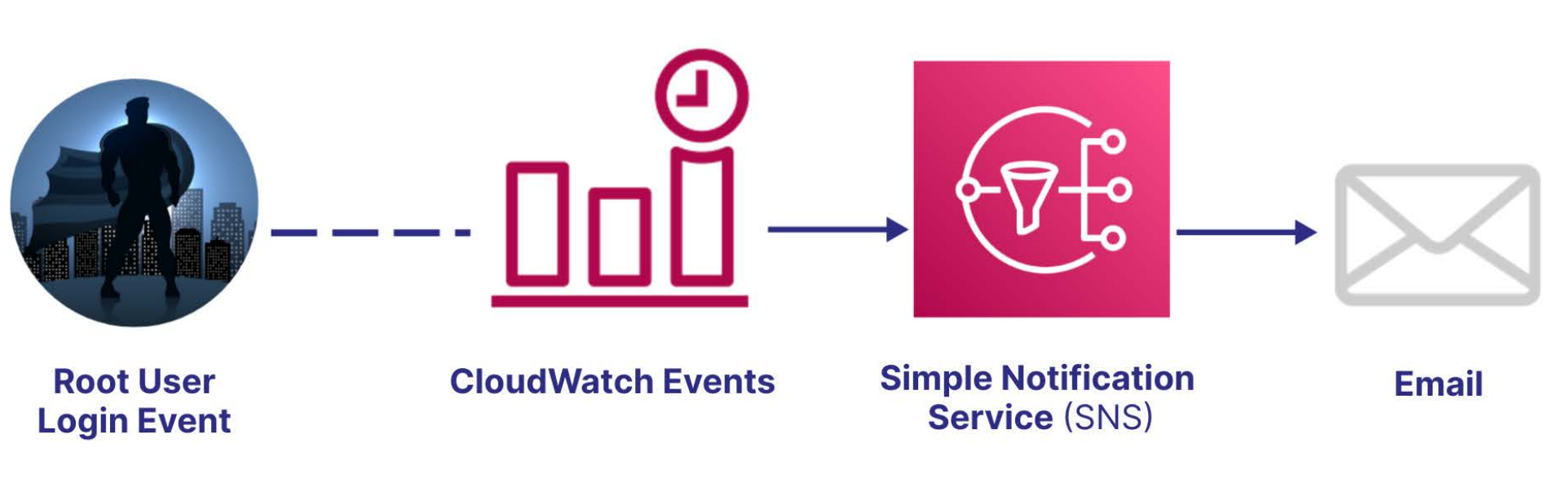
Provide real-time monitoring on EC2 instances.

CloudWatch Alarms can notify you if an EC2 instance goes into the stopped state or usage goes above a certain utilization.


EC2 instance >50% utilization
CloudWatch Alarms
Simple Notification Service (SNS)
Email

Receive a notification when root user activity is detected in your account.

Create a CloudWatch event rule to notify you when root user API calls are detected in your account indicating root user activity.



Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. **Let's see how to create a billing alarm using CloudWatch.**

VIDEO IS NOT AVAILABLE ON PDF VERSION

CLOUDTRAIL

CloudTrail

CloudTrail tracks user activity and API calls within your account.

- **Log and retain account activity**
- **Track activity through the console, SDKs, and CLI**
- **Identify which user made changes**
- **Detect unusual activity in your account**

CloudTrail in the Real World

Track the time a particular event occurred in your account.

You can troubleshoot events over the past 90 days using the CloudTrail event history log to find the specific time an event occurred on a per-Region basis. You can create a custom trail to extend past 90 days.

Things You Can Track with **CloudTrail**

- **Username**
- **Event time and name**
- **IP address**
- **Access key**
- **Region**
- **Error code**

Review Time!

CloudWatch | CloudTrail

CloudWatch

CloudWatch is a collection of services that help you monitor and observe your cloud resources.

CloudWatch Alarms | CloudWatch Logs | CloudWatch Metrics | CloudWatch Events

CloudTrail

CloudTrail tracks user activity and API calls within your account.

Things to Remember When Studying for the Exam

☑ **CloudWatch**
Don't forget you can use CloudWatch to monitor your EC2 instances and notify you when certain events occur.

☑ **CloudTrail**
Don't forget the things you can track with CloudTrail: username, event time and name, IP address, access key, Region, and error code.

Join us for the next lesson!

SECTION REVIEW

Technology Services

Let's review the services we covered in this section.

Here you'll also be able to link directly to each lesson to get a refresher on the services we discussed in this section.

Compute

EC2
EC2 allows you to rent and manage virtual servers in the cloud.

Lambda
Lambda is a serverless compute service that lets you run code without managing servers.

Fargate
Fargate is a serverless compute engine for containers.

Lightsail
Lightsail allows you to quickly launch all the resources you need for small projects.

Outposts
Outposts allows you to run cloud services in your internal data center.

Batch
Batch allows you to process large workloads in smaller chunks (or batches).

Storage

S3
S3 is an object storage service for the cloud that is highly available.

EBS
EBS is a storage device (called a volume) that can be attached to (or removed from) your instance.

EFS
EFS is a serverless network file system for sharing files.

Storage Gateway
Storage Gateway is a hybrid storage service.

Content Delivery

CloudFront
CloudFront is a CDN that delivers data and applications globally with low latency.

Global Accelerator
Global Accelerator sends your users through the AWS global network when accessing your content, speeding up delivery.

S3 Transfer Acceleration
S3 Transfer Acceleration improves content uploads and downloads to and from S3 buckets.

Networking

Route 53
Route 53 is a DNS service that routes users to applications.

Virtual Private Cloud (VPC)
VPC is a foundational service that allows you to create a secure private network in the AWS Cloud where you launch your resources.

Direct Connect
Direct Connect is a dedicated physical network connection from your on-premises data center to AWS.

Virtual Private Network (VPN)
Site-to-Site VPN creates a secure connection between your internal networks and your AWS VPCs.

Databases

Relational Database Service (RDS)
RDS is a service that makes it easy to launch and manage relational databases.

Aurora
Aurora is a relational database compatible with MySQL and PostgreSQL that was created by AWS.

DynamoDB
DynamoDB is a fully managed NoSQL key-value and document database.

DocumentDB
DocumentDB is a fully managed document database that supports MongoDB.

ElastiCache
ElastiCache is a fully managed in-memory datastore compatible with Redis or Memcached.

Neptune
Neptune is a fully managed graph database that supports highly connected datasets.

Migration and Transfer

Database Migration Service (DMS)
DMS helps you migrate databases to or within AWS.

Server Migration Service (SMS)
SMS allows you to migrate on-premises servers to AWS.

Snow Family
The Snow Family allows you to transfer large amounts of on-premises data to AWS using a physical device.

DataSync
DataSync allows for online data transfer from on-premises to AWS storage services like S3 or EFS.

Analytics

Redshift
Redshift is a scalable data warehouse solution.

Athena
Athena is a query service for Amazon S3.

Glue
Glue prepares your data for analytics.

Kinesis
Kinesis allows you to analyze data and video streams in real time.

Elastic MapReduce (EMR)
EMR helps you process large amounts of data.

Data Pipeline
Data Pipeline helps you move data between compute and storage services running either on AWS or on-premises.

Machine Learning

Rekognition
Rekognition allows you to automate your image and video analysis.

Comprehend
Comprehend is a natural-language processing (NLP) service that finds relationships in text.

Polly
Polly turns text into speech.

SageMaker
SageMaker helps you build, train, and deploy machine learning models quickly.

Translate
Translate provides language translation.

Lex
Lex helps you build conversational interfaces like chatbots.

Developer Tools

Cloud9
Cloud9 allows you to write code within an integrated development environment (IDE) from within your web browser.

CodeCommit
CodeCommit is a source control system for private Git repositories.

CodeBuild
CodeBuild allows you to build and test your application source code.

CodeDeploy
CodeDeploy manages the deployment of code to compute services in the cloud or on-premises.

CodePipeline
CodePipeline automates the software release process.

X-Ray
X-Ray helps you debug production applications.

Deployment and Infrastructure Management

CloudFormation
CloudFormation allows you to provision AWS resources using Infrastructure as Code (IaC).

Elastic Beanstalk
Elastic Beanstalk allows you to deploy your web applications and web services to AWS.

OpsWorks
OpsWorks allows you to use Chef or Puppet to automate the configuration of your servers and deploy code.

Messaging and Integration

Simple Queue Service (SQS)
SQS is a message queuing service that allows you to build loosely coupled systems.

Simple Notification Service (SNS)
SNS allows you to send emails and text messages from your applications.

Simple Email Service (SES)
SES is an email service that allows you to send richly formatted HTML emails from your applications.

Auditing, Monitoring, and Logging

CloudWatch
CloudWatch is a collection of services that help you monitor and observe your cloud resources.

CloudTrail
CloudTrail tracks user activity and API calls within your account.

Join us for the next lesson!

A CLOUD GURU

Security and Compliance Section Introduction

AWS CERTIFIED CLOUD PRACTITIONER

GET STARTED

Let's take a closer look!

Security and Compliance

Let's review the services we'll cover in this section.

Here you'll also be able to link directly to each lesson.

Shared Responsibility Model

The shared responsibility model outlines your responsibilities vs AWS' when it comes to security and compliance.

Well-Architected Framework

The well-architected framework describes design principles and best practices for running workloads in the cloud.

Security

Identity and Access Management (IAM)

IAM allows you to control access to your AWS services and resources.

Web Application Firewall (WAF)

WAF helps protect your web applications against common web attacks.

Shield

Shield is a managed Distributed Denial of Service (DDoS) protection service.

Macie

Macie helps you discover and protect sensitive data.

Config

Config allows you to assess, audit, and evaluate the configurations of your resources.

GuardDuty

GuardDuty is an intelligent threat detection system that uncovers unauthorized behavior.

Inspector

Inspector works with EC2 instances to uncover and report vulnerabilities.

Artifact

Artifact offers on-demand access to AWS security and compliance reports.

Encryption

Key Management Service (KMS)

KMS allows you to generate and store encryption keys.

CloudHSM

CloudHSM is a hardware security module (HSM) used to generate encryption keys.

Secrets Management

Secrets Manager

Secrets Manager allows you to manage and retrieve secrets (passwords or keys).

Join us for the next lesson!

A CLOUD GURU

Understanding the Shared Responsibility Model

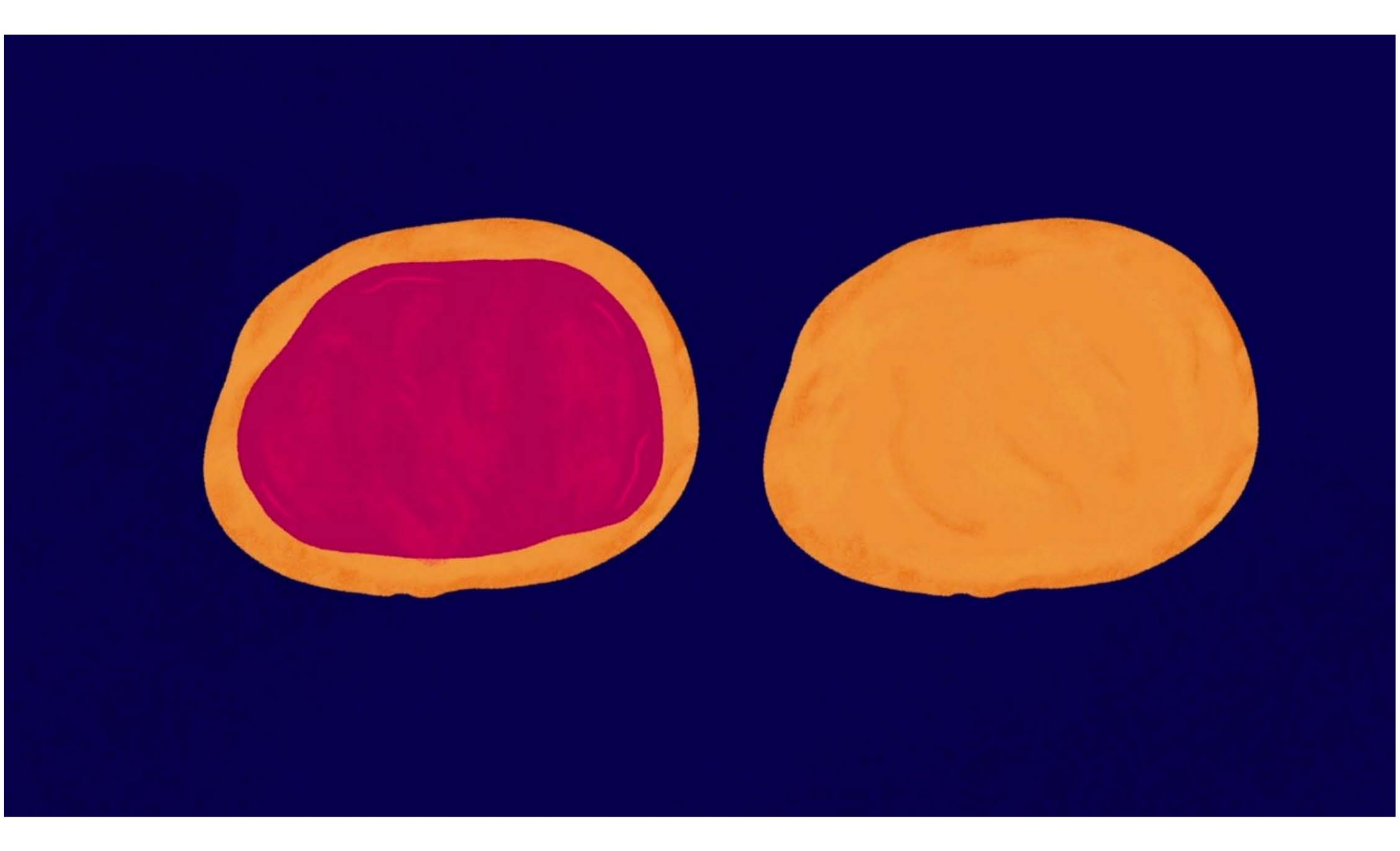
AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Shared Responsibility Model
2. Review

GET STARTED

Alfredo's Pizza



SHARED RESPONSIBILITY MODEL

Shared Responsibility Model

In the **public cloud**, there is a **shared** security **responsibility** between **you** and **AWS**.

AWS' responsibility	**Your responsibility**
Security of the Cloud	**Security in the Cloud**

Security of the Cloud

AWS is responsible for **protecting** and securing their **infrastructure**.

AWS Global Infrastructure

AWS is responsible for its global infrastructure elements: Regions, edge locations, and Availability Zones.

Building Security

AWS controls access to its data centers where your data resides.

Networking Components

AWS maintains networking components: generators, uninterruptible power supply (UPS) systems, computer room air conditioning (CRAC) units, fire suppression systems, and more.

Software

AWS is responsible for any managed service like RDS, S3, ECS, or Lambda, patching of host operating systems, and data access endpoints.

Security in the Cloud

You are responsible for **how** the services are implemented and managing your **application data**.

Application Data	You are responsible for managing your application data, which includes **encryption** options.
Security Configuration	You are responsible for **securing** your account and API calls, **rotating** credentials, **restricting** internet access from your VPCs, and more.
Patching	You are responsible for the **guest operating system (OS)**, which includes updates and security patches.
Identity and Access Management	You are responsible for application **security** and identity and access management.
Network Traffic	You are responsible for **network traffic protection**, which includes security group **firewall configuration**.
Installed Software	You are responsible for your **application code**, installed software, and more. You should frequently scan for and **patch vulnerabilities** in your code.

Who is responsible for what?

Firewall configuration	✋
Data center security for the physical building	aws
Encryption of EBS volumes	✋
Language versions of Lambda	aws
Taking DB backups in RDS	✋
Updating the firmware on the underlying EC2 hosts	aws
Ensuring data is encrypted at rest	✋
Managing the network infrastructure	aws
Patching the guest operating system for EC2	✋
Physically destroying storage media at end of life	aws

EC2 Shared Responsibility Model

Let's take a closer look at the shared responsibility model for **EC2**.

You

- Installed applications
- Patching the **guest operating** system
- Security controls

EC2

AWS

- EC2 service
- Patching the **host operating** system
- Security of the physical server

Lambda Shared Responsibility Model

Let's take a closer look at the shared responsibility model for **Lambda.**

You

- Security of code
- Storage of sensitive data
- IAM for permissions

Lambda

AWS

- Lambda service
- Upgrading Lambda languages
- Lambda endpoints
- Operating system
- Underlying infrastructure
- Software dependencies

Which security responsibilities are shared?

Patch Management	Configuration Management	Awareness and Training
aws Patching infrastructure	aws Configuring infrastructure devices	aws AWS employees
✋ Patching guest OS and applications	✋ Configuring databases and applications	✋ Your employees

How do I report abuse of AWS resources?

Contact the **AWS Trust & Safety** team using the **Report Amazon AWS abuse** form or by contacting **abuse@amazonaws.com**.

Review Time!

Shared Responsibility Model

In the public cloud, there is a shared security responsibility between you and AWS.

AWS' responsibility	**Your responsibility**
Security **of** the Cloud	Security **in** the Cloud

Things to Remember When Studying for the Exam

☑ **Shared Responsibility Model**

Going into the exam, remember what you are responsible for and what AWS is responsible for.

Join us for the next lesson!

A CLOUD GURU

Leveraging the Well-Architected Framework

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1 Well-Architected Framework

3 Review

GET STARTED

WELL-ARCHITECTED FRAMEWORK

Well-Architected Framework

The **5 pillars** of the **Well-Architected Framework** describe design principles and best practices for running workloads in the cloud.

- **Operational Excellence**
- **Security**
- **Reliability**
- **Performance Efficiency**
- **Cost Optimization**

5 Pillars

Operational Excellence

This pillar focuses on creating applications that effectively support production workloads.

- **Plan for and anticipate failure**
- **Deploy smaller, reversible changes**
- **Script operations as code**
- **Learn from failure and refine**

Security

This pillar focuses on putting mechanisms in place that help protect your systems and data.

- **Automate security tasks**
- **Encrypt data in transit and at rest**
- **Assign only the least privileges required**
- **Track who did what and when**
- **Ensure security at all application layers**

Reliability

This pillar focuses on designing systems that work consistently and recover quickly.

- **Recover from failure automatically**
- **Scale horizontally for resilience**
- **Reduce idle resources**
- **Manage change through automation**
- **Test recovery procedures**

Performance Efficiency

This pillar focuses on the effective use of computing resources to meet system and business requirements while removing bottlenecks.

- **Use serverless architectures first**
- **Use multi-region deployments**
- **Delegate tasks to a cloud vendor**
- **Experiment with virtual resources**

Cost Optimization

This pillar focuses on delivering optimum and resilient solutions at the least cost to the user.

- **Utilize consumption-based pricing**
- **Implement Cloud Financial Management**
- **Measure overall efficiency**
- **Pay only for resources your application requires**

5 Pillars in the Real World

Here are a **few examples** of applying best practices and design principles from the 5 pillars of the **Well-Architected Framework** in the real world.

1 Operational Excellence

CodeCommit

You can use AWS CodeCommit for version control to enable tracking of code changes and to version-control CloudFormation templates of your infrastructure.

2 Security

CloudTrail

You can configure central logging of all actions performed in your account using CloudTrail.

3 Reliability

RDS

You can use Multi-AZ deployments for enhanced availability and reliability of RDS databases.

4 Performance Efficiency

Lambda

You can use AWS Lambda to run code with zero administration.

5 Cost Optimization

S3

You can use S3 Intelligent-Tiering to automatically move your data between access tiers based on your usage patterns.

Review Time!

Well-Architected Framework

The 5 pillars of the Well-Architected Framework describe design principles and best practices for running workloads in the cloud.

- **Operational Excellence**
- **Security**
- **Reliability**
- **Performance Efficiency**
- **Cost Optimization**

Things to Remember When Studying for the Exam

☑ **Well-Architected Framework**

Going into the exam, remember the 5 pillars and their real-world use cases.

Join us for the next lesson!

A CLOUD GURU

Understanding IAM Users

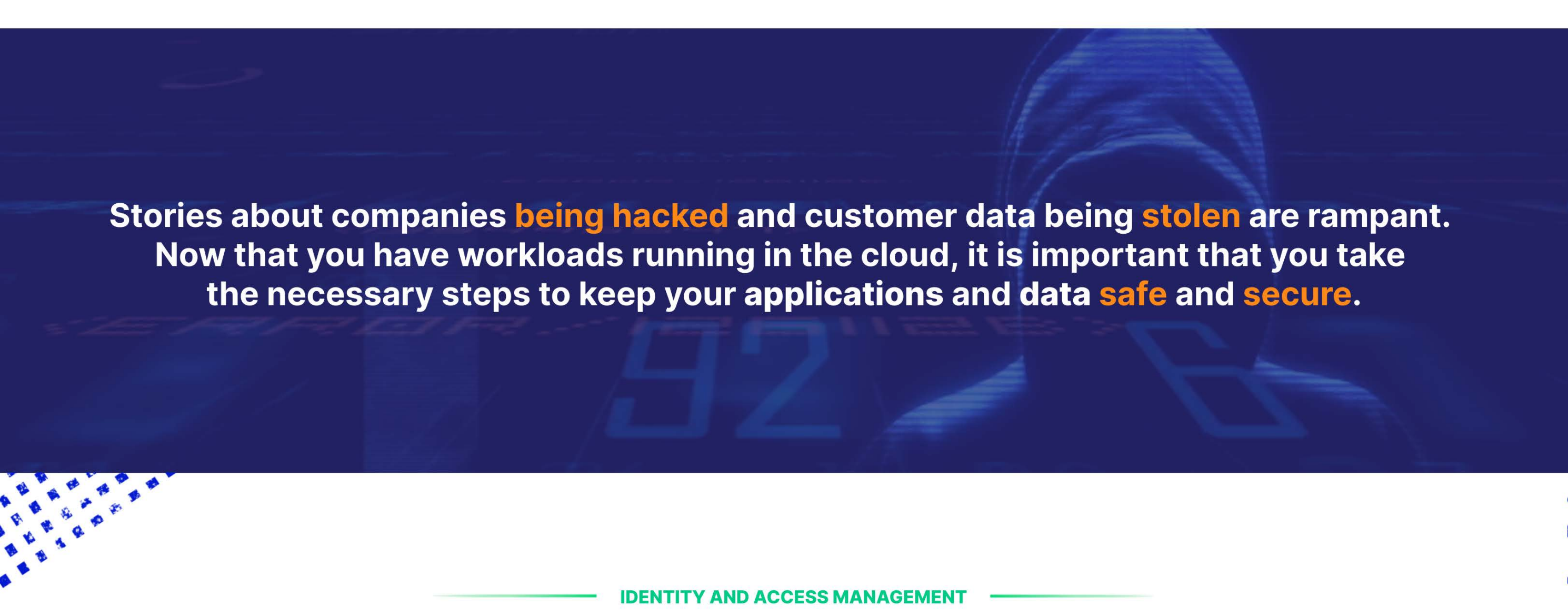
LESSON BREAKDOWN

1 IAM
2 Users
3 Groups
4 Review

GET STARTED

The Bigger Picture

Let's discuss why you should control access to your AWS services and resources.

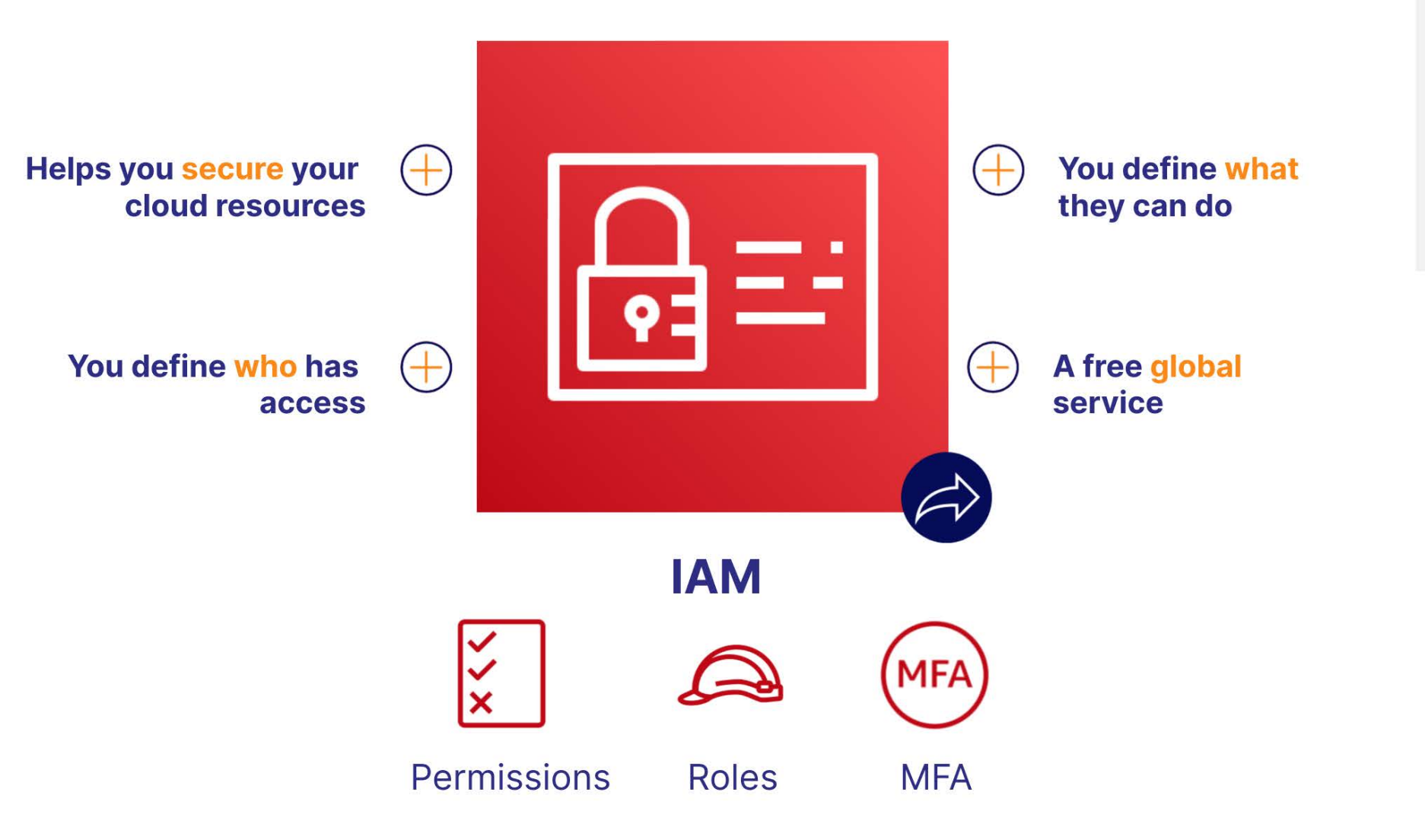


Stories about companies being hacked and customer data being stolen are rampant. Now that you have workloads running in the cloud, it is important that you take the necessary steps to keep your applications and data safe and secure.

IDENTITY AND ACCESS MANAGEMENT

Identity and Access Management (IAM)

IAM allows you to control access to your AWS services and resources.


Helps you secure your cloud resources
You define who has access
You define what they can do
A free global service
IAM
Permissions
Roles
MFA

ACG Blog

If you'd like to learn how to troubleshoot IAM errors, check out my blog post, **Fixing 5 Common AWS IAM Errors**.

Identities vs. Access

Identities

Who can access your resources

- Root user
- Individual users
- Groups
- Roles

VS

Access

What resources they can access

- Policies
- AWS managed policies
- Customer managed policies
- Permissions boundaries

Authentication ("Who") vs. Authorization ("What")

What Is **Authentication?**

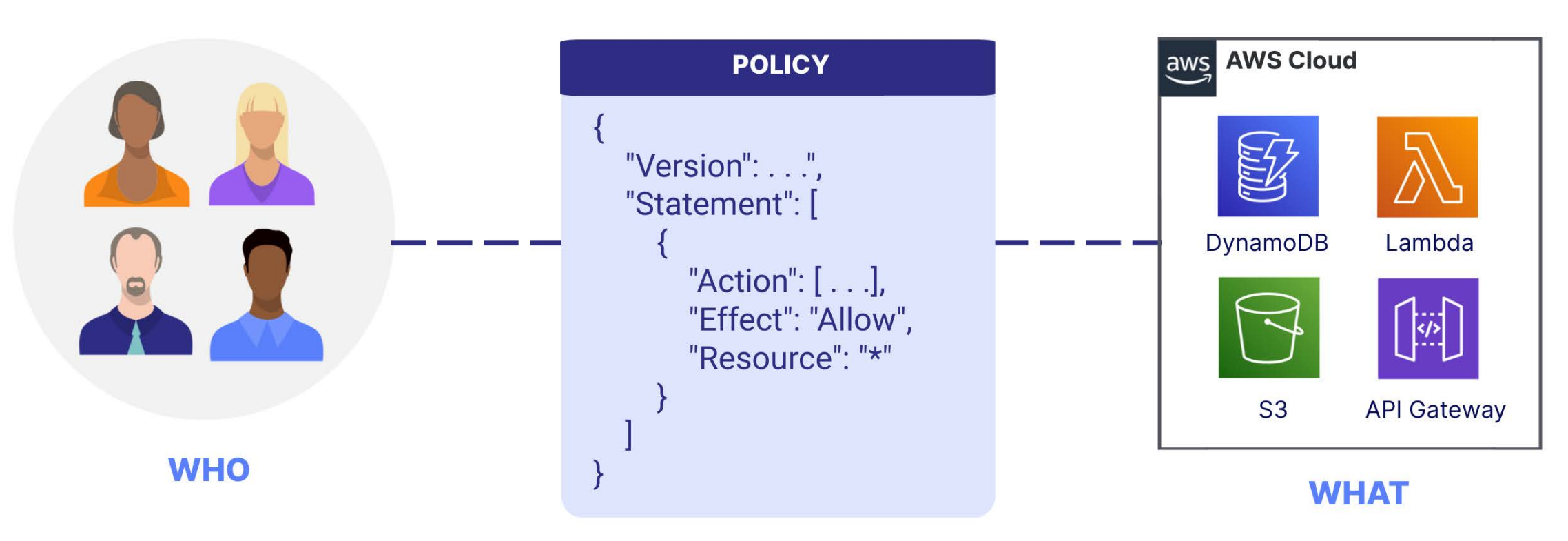
CLICK HERE

Authentication is where you present your identity (**username**) and provide verification (**password**).

What Is **Authorization?**

CLICK HERE

Authorization determines which services and resources the authenticated identity has **access** to.



```
{
  "Version": . . .",
  "Statement": [
    {
      "Action": [ . . .],
      "Effect": "Allow",
      "Resource": "*"
    }
  ]
}
```

USERS

Users

Users are entities you create in **IAM** to represent the **person** or **application** needing to access your **AWS resources**.

ROOT USER

The root user is created when you first open your AWS account.

What can only the root user do?

- Close your account
- Change email address
- Modify your support plan

READ ENTIRE LIST

USERS

Individual users are created in IAM and are used for everyday tasks.

What can individual users do?

- Perform administrative tasks
- Access application code
- Launch EC2 instances
- Configure databases

Don't forget activity performed by users in your account is billed to your account!

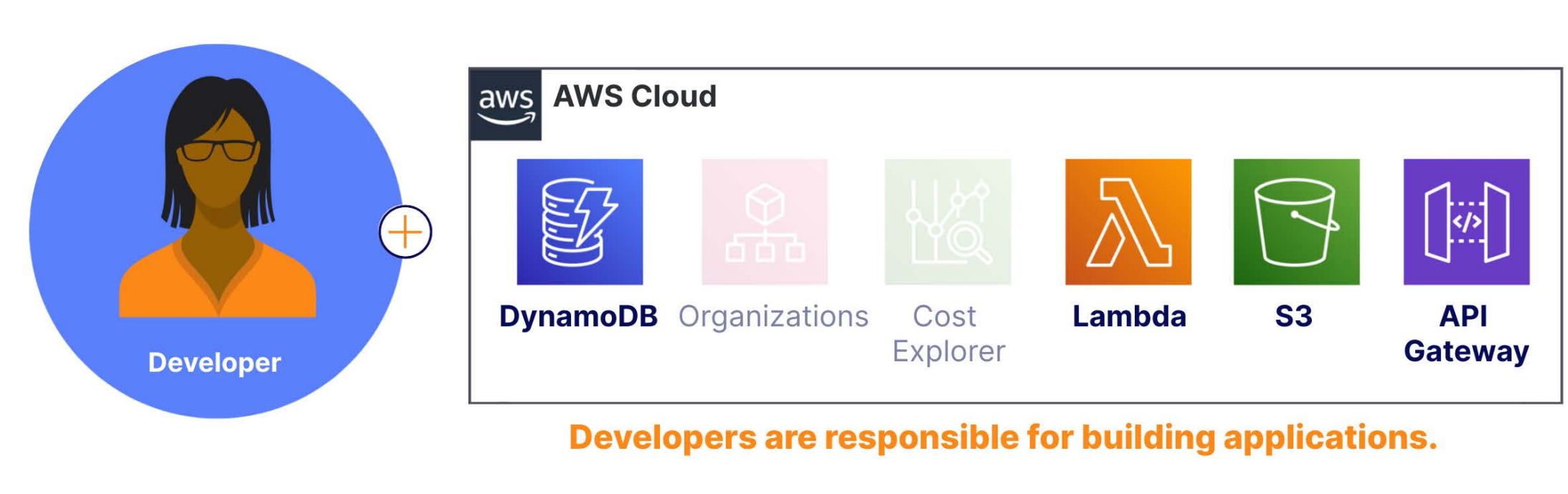
APPLICATIONS

Did you know applications can be users?

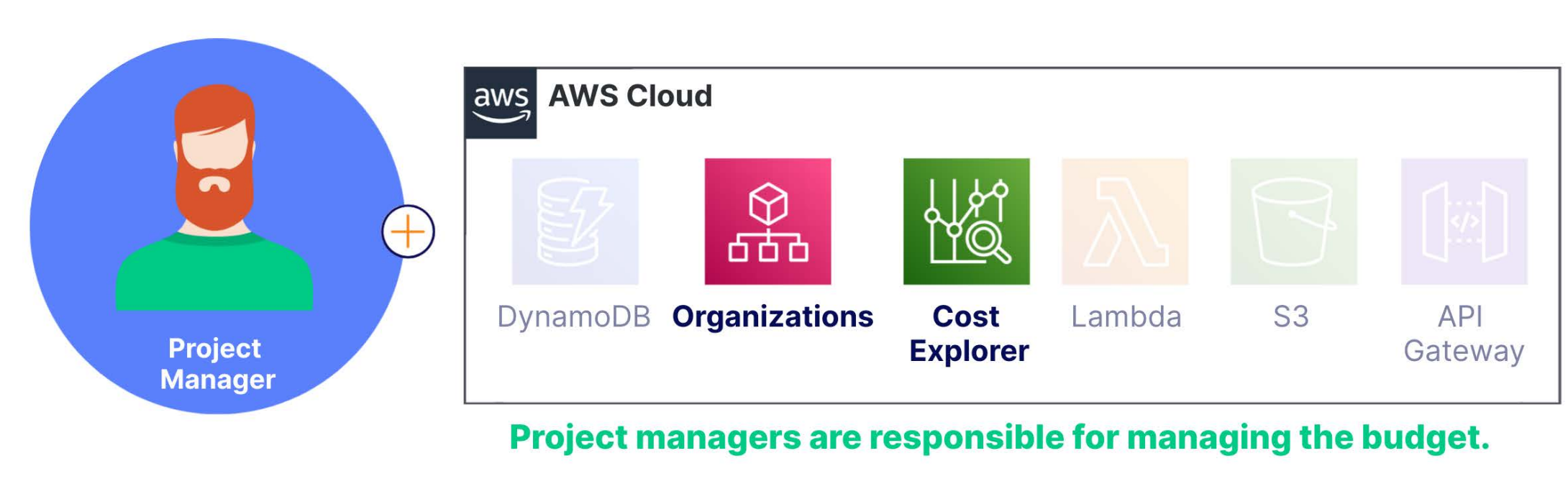
You'll create a user in IAM so you can generate access keys for an application running on-premises that needs access to your cloud resources.

Have you heard of the principle of least privilege?

The **principle of least privilege** involves giving a user the **minimum** access required to get the job done.



Developers are responsible for building applications.

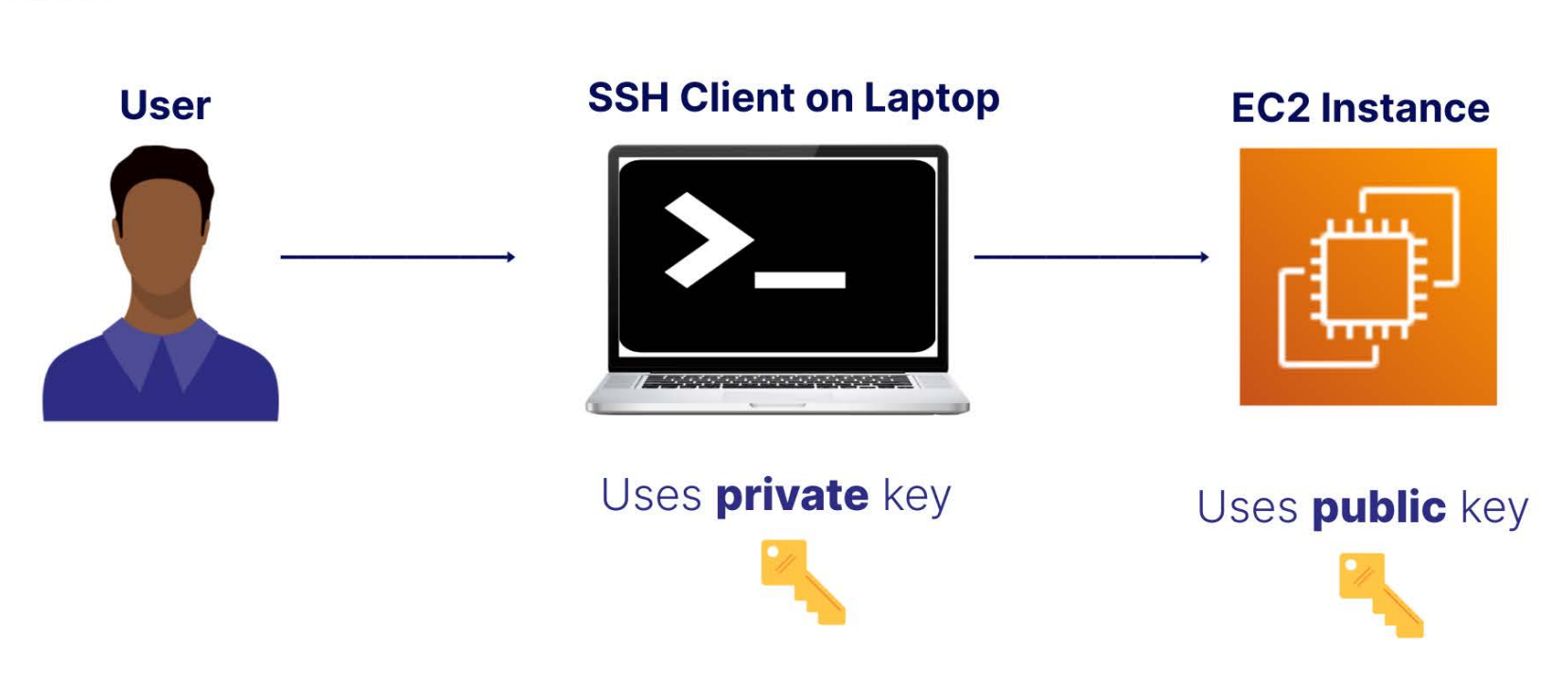


Project managers are responsible for managing the budget.

Users in the Real World

Create access keys for an IAM user that needs access to the AWS CLI.

The **AWS Command Line Interface (CLI)** allows you to access resources in your AWS account through a terminal or command window. **Access keys** are needed when using the **CLI** and can be generated using **IAM.**



GROUPS

Groups

A group is a **collection of IAM users** that helps you apply common access controls to all group members.

Administrators

Administrators perform administrative tasks such as creating new users.

Developers

Developers use compute and database services to build applications.

Analysts

Analysts run budget and usage reports.

Do **not** confuse security groups for EC2 with IAM groups. EC2 security groups act as firewalls, while IAM groups are collections of users.

KEY TAKEAWAYS

Groups

- ☑ Used to group users that perform similar tasks.
- ☑ Access permissions apply to all members of the group.
- ☑ Access is assigned using policies and roles.

Groups in the Real World

Apply the same access controls to a large set of users.

Groups save you time by allowing you to apply the same access permissions to more than one user at once. When a user no longer needs access, they can be removed from the group.

Review Time!

IAM Users Groups

IAM

IAM allows you to control access to your AWS services and resources.

Users

Users are entities you create in IAM to represent the person or application needing to access your AWS resources.

Groups

A group is a collection of IAM users that helps you apply common access controls to all group members.

Things to Remember When Studying for the Exam

☑ **Users and groups**

Going into the exam, understand the differences between users and group.

☑ **Root user tasks**

Remember the tasks that only the root user can do.

☑ **Principle of least privilege**

Don't forget about the principle of least privilege.

☑ **Real-world use cases**

Don't forget the real-world use cases for IAM.

Join us for the next lesson!

A CLOUD GURU

Understanding IAM Permissions

LESSON BREAKDOWN

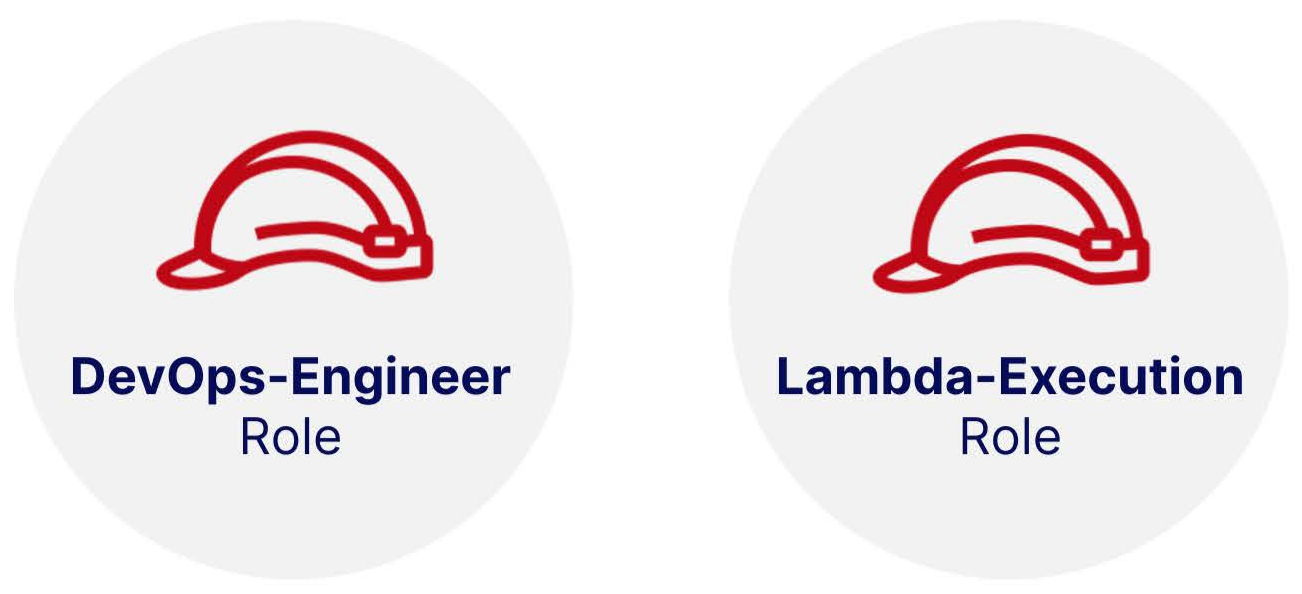
1. Roles
2. Policies
3. IAM Credential Report
4. Review

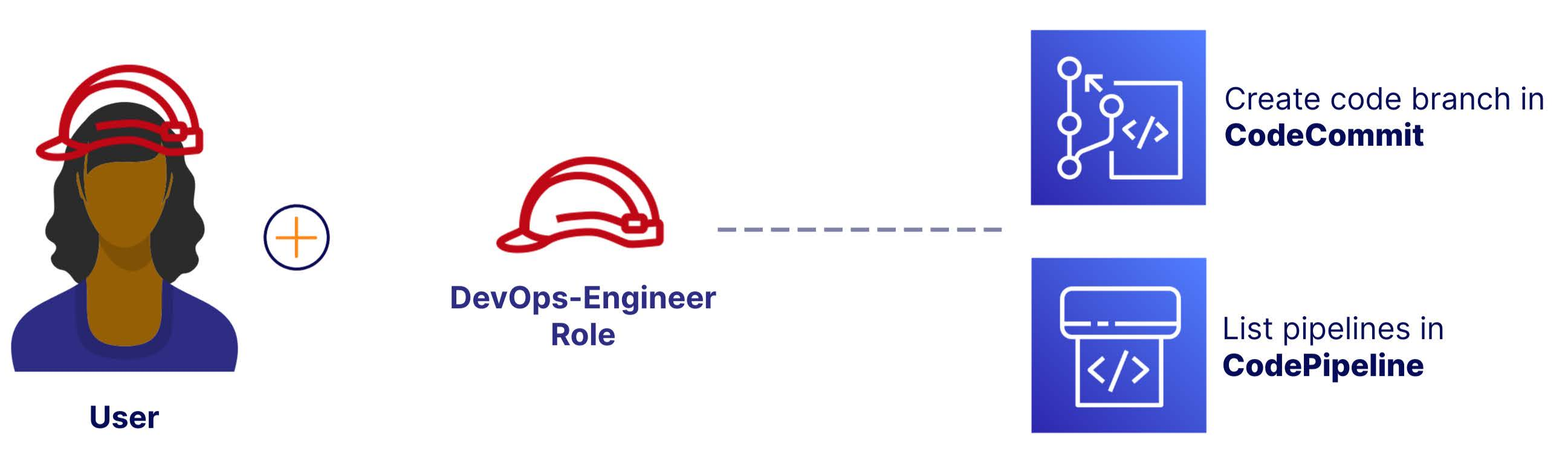
GET STARTED

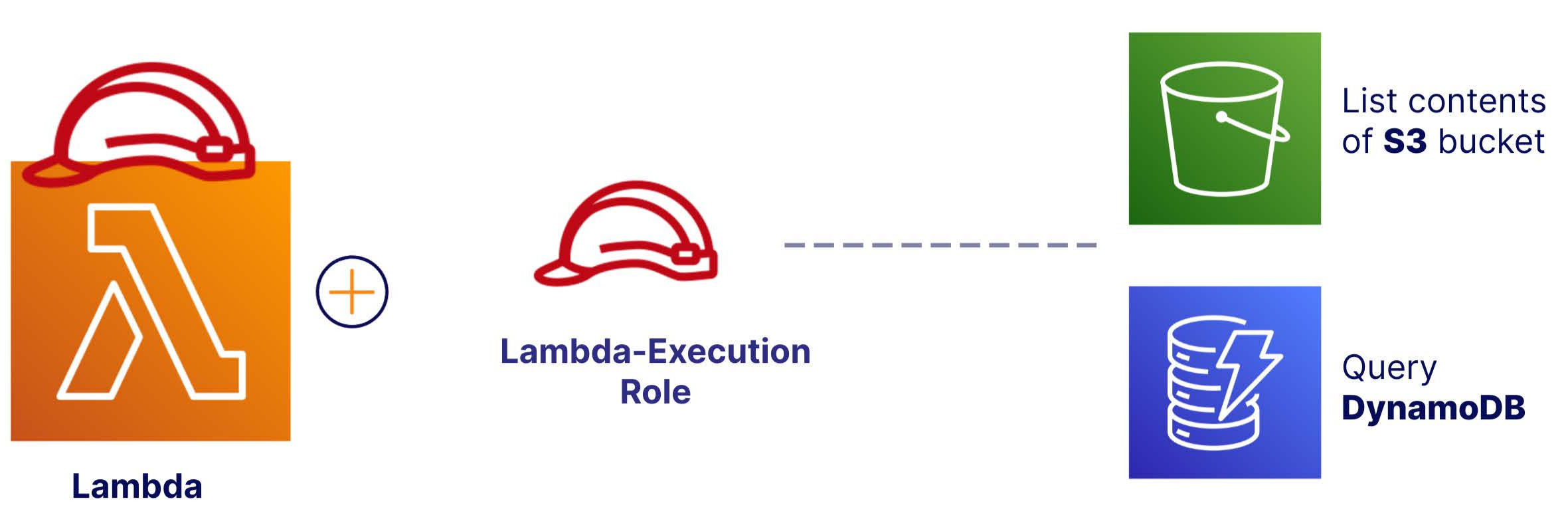
ROLES

Roles

Roles define access permissions and are temporarily assumed by an IAM user or service.




User
DevOps-Engineer Role
Create code branch in **CodeCommit**
List pipelines in **CodePipeline**



KEY TAKEAWAYS

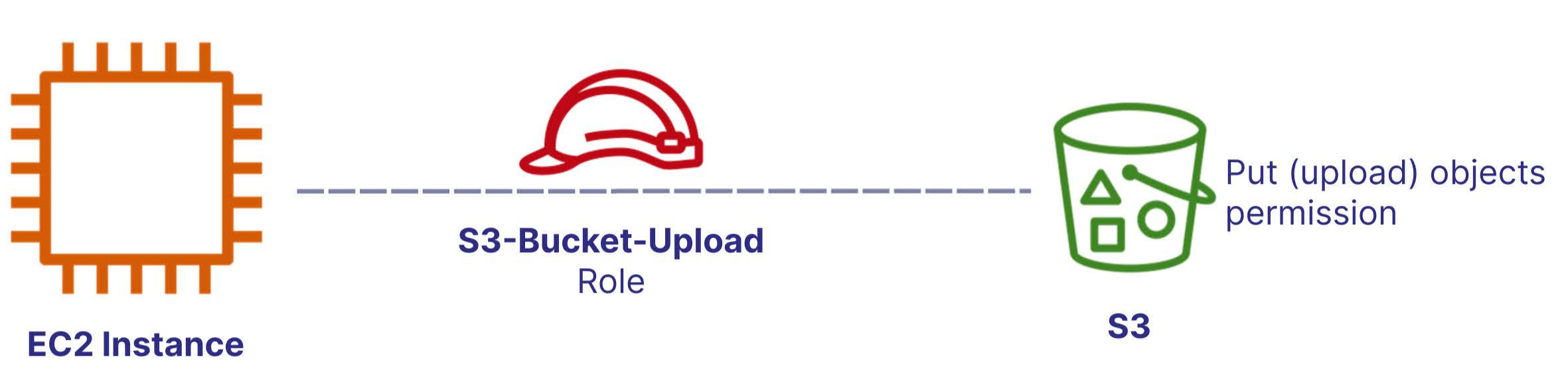
Roles

- ☑ You assume a role to perform a task in a single session.
- ☑ Assumed by any user or service that needs it.
- ☑ Access is assigned using policies.
- ☑ You grant users in one AWS account access to resources in another AWS account.

Roles in the Real World

Attach a role to an EC2 instance for access to S3.

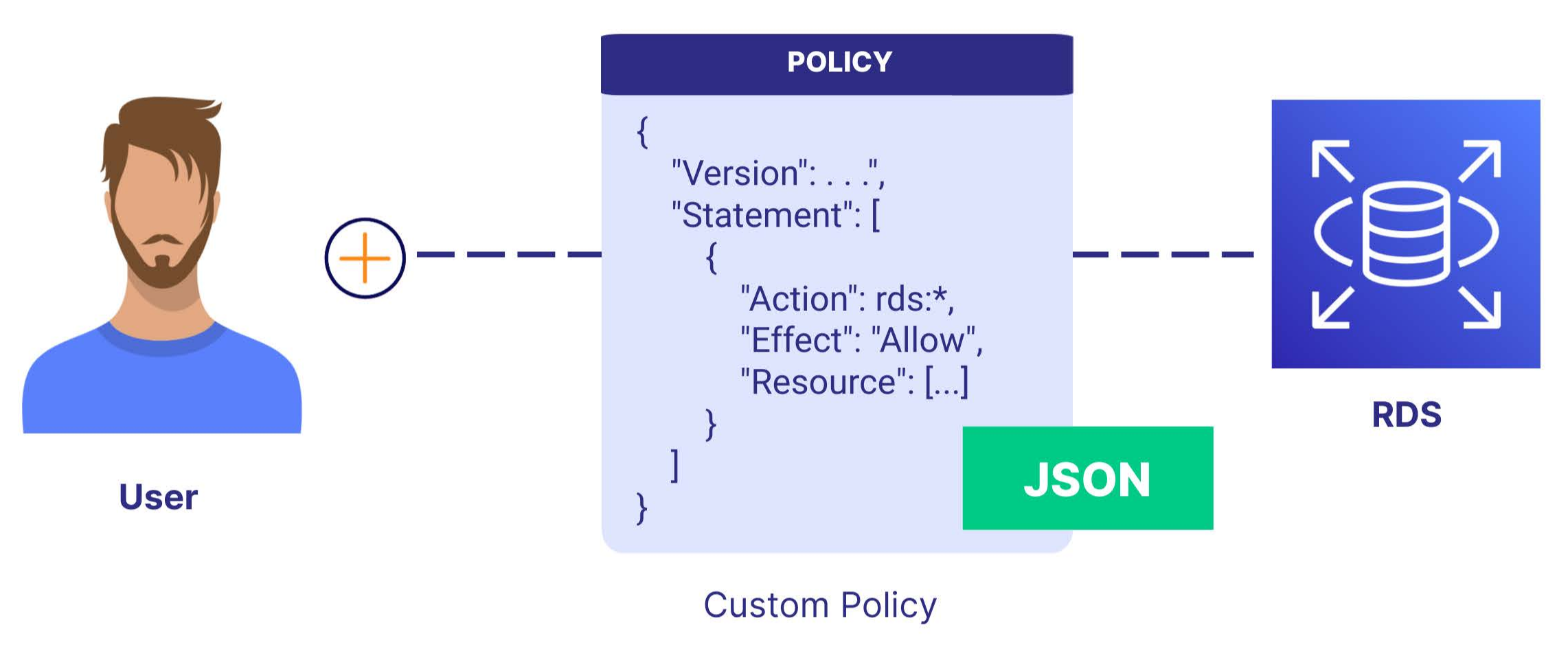
You can attach a role to an instance that provides privileges (e.g., uploading files to S3) to applications running on the instance. Roles help you avoid sharing long-term credentials like access keys and protect your instances from unauthorized access.



POLICIES

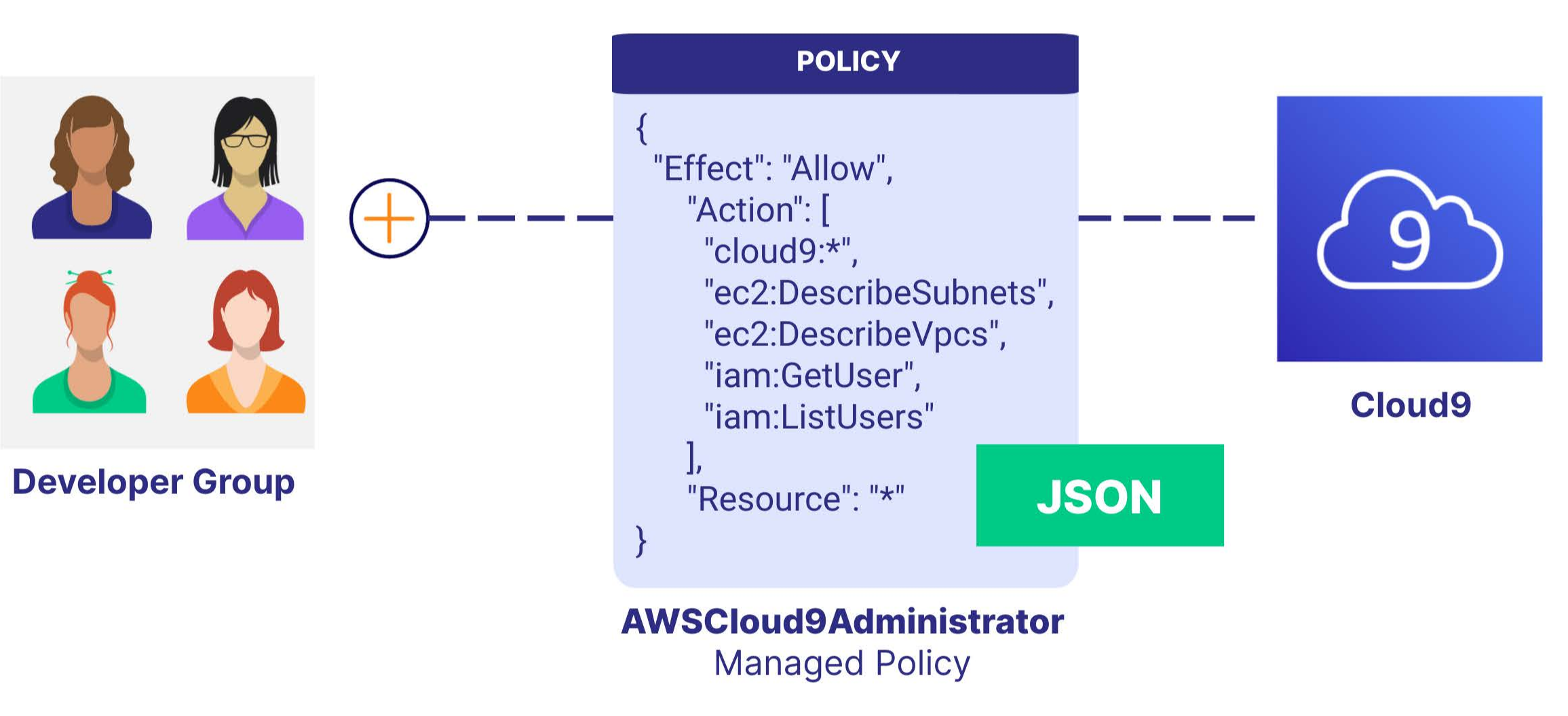
Policies

You manage permissions for IAM users, groups, and roles by creating a policy document in **JSON** format and attaching it.



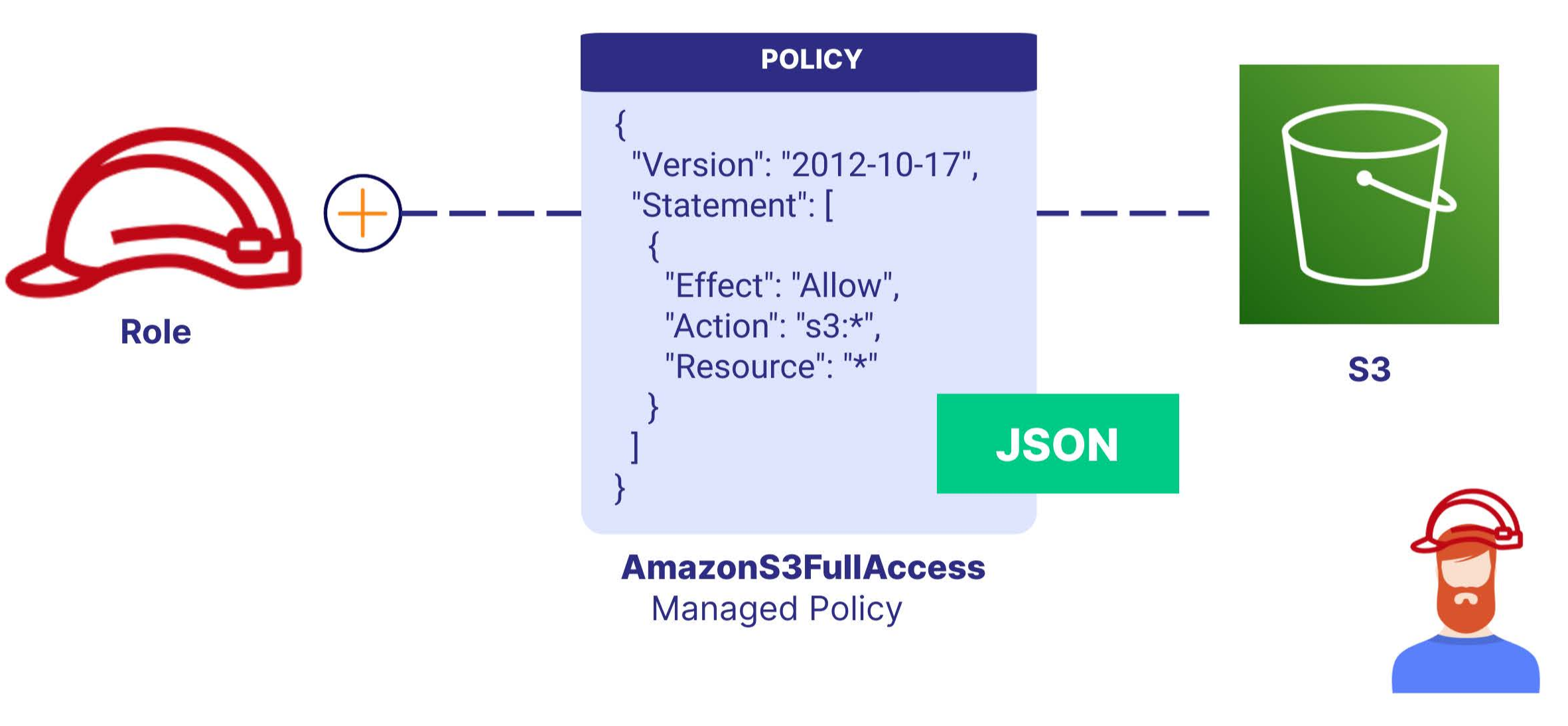
```
{
  "Version": . . .",
  "Statement": [
    {
      "Action": rds:*,
      "Effect": "Allow",
      "Resource": [...]
    }
  ]
}
```

Custom Policy



```
{
 "Effect": "Allow",
   "Action": [
    "cloud9:*",
    "ec2:DescribeSubnets",
    "ec2:DescribeVpcs",
    "iam:GetUser",
    "iam:ListUsers"
   ],
   "Resource": "*"
}
```

AWSCloud9Administrator
Managed Policy



```
{
 "Version": "2012-10-17",
 "Statement": [
  {
   "Effect": "Allow",
   "Action": "s3:*",
   "Resource": "*"
  }
 ]
}
```

AmazonS3FullAccess
Managed Policy

Policies in the Real World

You can limit access to an Amazon S3 bucket to specific users.

You can add a bucket access policy directly to an Amazon S3 bucket to grant IAM users access permissions for the bucket and the objects in it.

IAM Best Practices

There are several recommended best practices for IAM.

1 **Enable MFA for privileged users.**

You should enable multi-factor authentication (MFA) for the root user and other administrative users.

2 **Implement strong password policies.**

You should require IAM users to change their passwords after a specified period of time, prevent users from reusing previous passwords, and rotate security credentials regularly.

3 **Create individual users instead of using root.**

You shouldn't use the root user for daily tasks.

4 **Use roles for Amazon EC2 instances.**

You should use roles for applications that run on EC2 instances instead of long-term credentials like access keys.

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see users, groups, and policies in action.

VIDEO IS NOT AVAILABLE ON PDF VERSION

IAM CREDENTIAL REPORT

IAM Credential Report

The IAM credential report lists all users in your account and the status of their various credentials.

Lists all users and status of passwords, access keys, and MFA devices
Used for auditing and compliance

Review Time!

Roles | Policies | Credential Report

Roles

Roles define access permissions and are temporarily assumed by an IAM user or service.

Policies

You manage permissions for IAM users, groups, and roles by creating a policy document in JSON format and attaching it.

POLICY

```
{
 "Version": "2012-10-17",
 "Statement": [
  {
   "Effect": "Allow",
   "Action": "s3:*",
   "Resource": "*"
  }
 ]
}
```

JSON

Credential Report

The IAM credential report lists all users in your account and the status of their various credentials.

Things to Remember When Studying for the Exam

- ☑ **Users, groups, roles, and policies**
  Going into the exam, understand the differences between users, groups, roles, and policies.
- ☑ **Real-world use cases**
  Don't forget the real-world use cases for IAM.
- ☑ **IAM best practices**
  Don't forget to familiarize yourself with IAM best practices.
- ☑ **IAM credential report**
  Don't forget the importance of the IAM credential report.

Join us for the next lesson!

A CLOUD GURU

Exploring Application Security Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. WAF
2. Shield
3. Macie
4. Review

GET STARTED

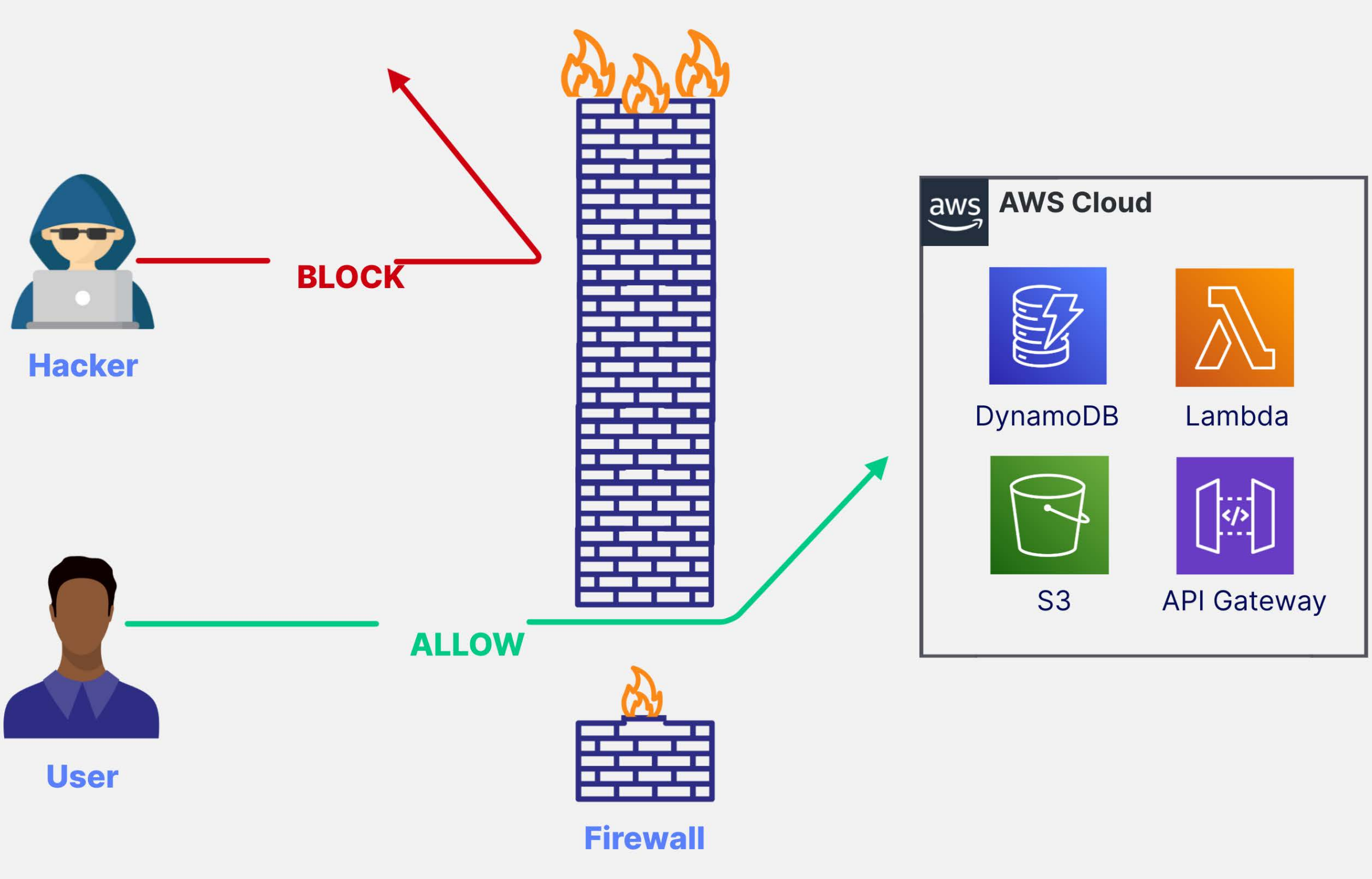
The Bigger Picture

Let's discuss why you should **control access to your AWS services** and resources using software-based security tools.

AWS has several **software-based** security tools available to help you **monitor** and **protect** your resources.

What Is a Firewall?

Firewalls prevent unauthorized access to your networks by **inspecting** incoming and outgoing traffic against security rules you've defined.



WEB APPLICATION FIREWALL

Web Application Firewall (WAF)

WAF helps protect your web applications against common web attacks.

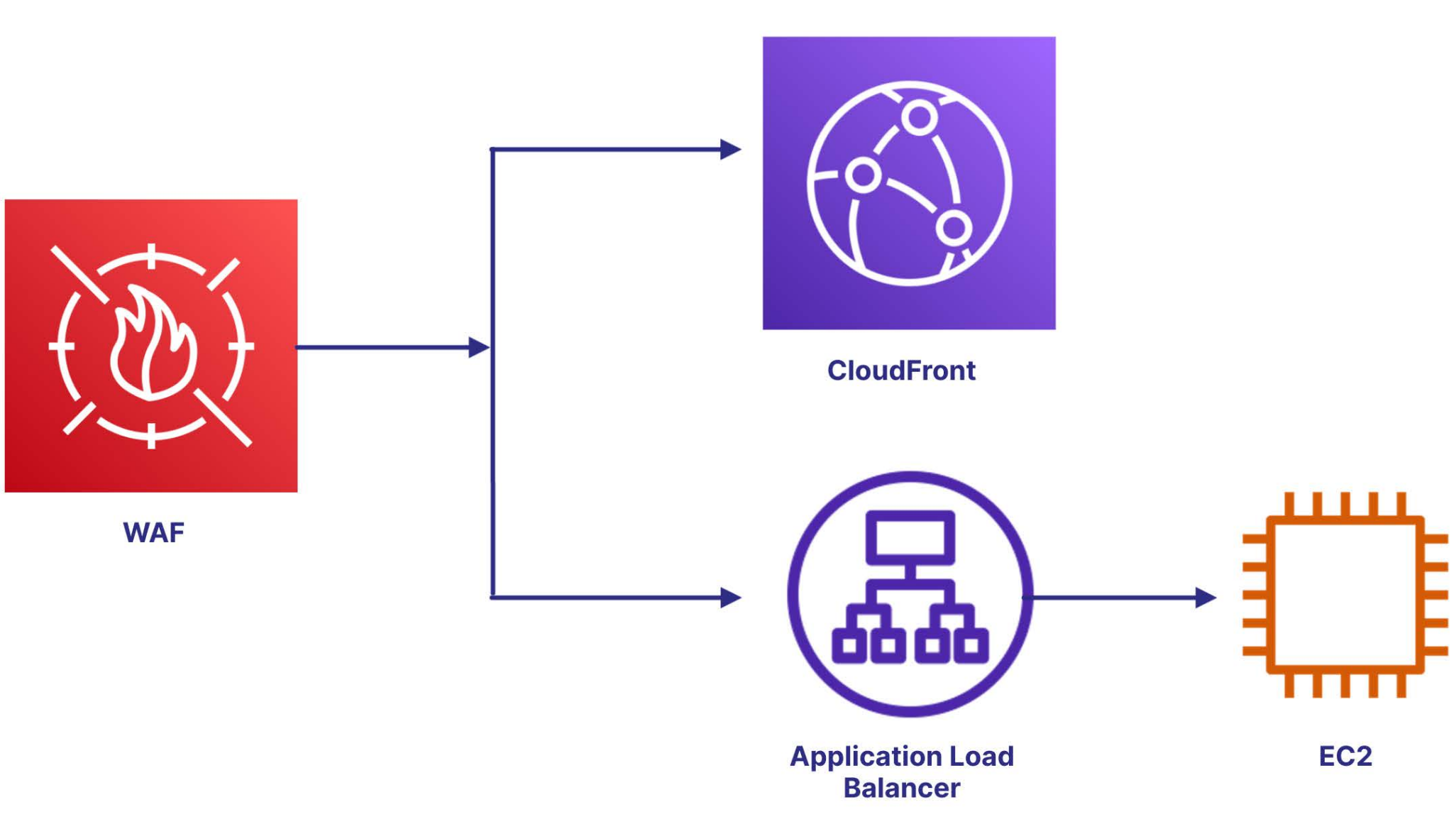
- Protects apps against common attack patterns
- Protects against SQL injection
- Protects against cross-site scripting

WAF

WAF in the Real World

Protect your web application from cross-site scripting attacks.

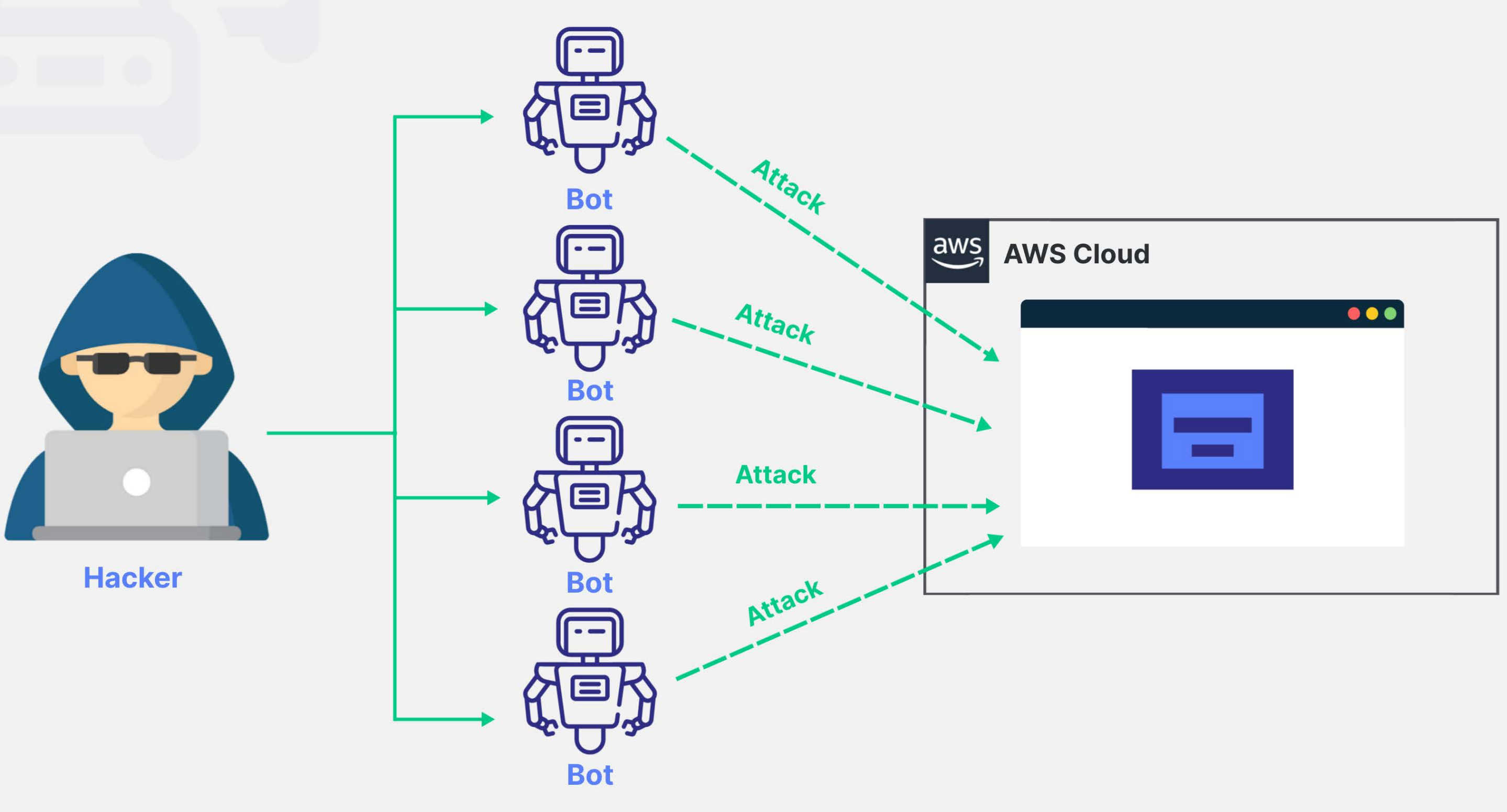
You can deploy a web application directly to an EC2 instance and protect it from cross-site scripting attacks using WAF. You can even deploy WAF on CloudFront as part of your CDN solution to block malicious traffic.



Distributed Denial of Service (DDoS)

Have you heard about DDoS?

A **DDoS** attack causes a traffic jam on a website or web application in an attempt to cause it to crash.



SHIELD

Shield

Shield is a managed Distributed Denial of Service **(DDoS)** protection service.

- Always-on detection
- Shield Standard is free
- Shield Advanced is a paid service

Shield

1 Shield Standard

Provides free protection against common and frequently occurring attacks

2 Shield Advanced

Provides enhanced protections and 24/7 access to AWS experts for a fee

DDoS protection via **Shield Advanced** is supported on several services.

- CloudFront
- Route 53
- Elastic Load Balancing
- AWS Global Accelerator

Shield in the Real World

Receive real-time notifications of suspected DDoS incidents and assistance from AWS during the attack.

Shield Advanced will give you notifications of DDoS attacks via CloudWatch metrics. Additionally, with Shield Advanced, you have 24/7 access to AWS experts to assist during an attack.

MACIE

Macie

Macie helps you discover and protect sensitive data.

- Uses machine learning
- Evaluates S3 environment
- Uncovers personally identifiable information (PII)

Macie

Macie in the Real World

Discover passport numbers stored on S3.

Macie can be used to find sensitive data like passport numbers, social security numbers, and credit card numbers on S3.

Review Time!

WAF | Shield | Macie

WAF

WAF helps protect your web applications against common web attacks.

Shield

Shield is a managed Distributed Denial of Service (DDoS) protection service.

Macie

Macie helps you discover and protect sensitive data.

Things to Remember When Studying for the Exam

☑ **WAF**

Going into the exam, don't forget WAF protects against SQL injection and cross-site scripting attacks.

☑ **Shield**

Don't forget Shield provides DDoS protection and works with CloudFront, Route 53, Elastic Load Balancing, and AWS Global Accelerator.

☑ **Macie**

Remember that Macie helps you find sensitive information.

Join us for the next lesson!

A CLOUD GURU

Exploring Additional Security Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Config
2. GuardDuty
3. Inspector
4. Artifact
5. Review

GET STARTED

CONFIG

Config

Config allows you to assess, audit, and evaluate the configurations of your resources.

- Track configuration changes over time
- Delivers configuration history file to S3
- Notifications via Simple Notification Service (SNS) of every configuration change

Config

Config in the Real World

Identify system-level configuration changes made to your EC2 instances.

Config allows you to record configuration changes within your EC2 instances. You can view network, software, and operating system (OS) configuration changes, system-level updates, and more.

GUARDDUTY

GuardDuty

GuardDuty is an intelligent threat detection system that uncovers unauthorized behavior.

- Uses machine learning
- Built-in detection for EC2, S3, and IAM
- Reviews CloudTrail, VPC Flow Logs, and DNS logs

GuardDuty

GuardDuty in the Real World

Detect unusual API calls in your account.

GuardDuty's anomaly detection feature evaluates all API requests in your account and identifies events that are associated with common techniques used by attackers.

INSPECTOR

Inspector

Inspector works with **EC2** instances to uncover and report vulnerabilities.

- Agent installed on EC2 instance
- Reports vulnerabilities found
- Checks access from the internet, remote root login, vulnerable software versions, etc.

Inspector

Inspector in the Real World

Identify unintended network access to an EC2 instance via a detailed report of security findings.

Inspector has several built-in rules to access your EC2 instances to find vulnerabilities and report them prioritized by level of severity.

ARTIFACT

Artifact

Artifact offers on-demand access to AWS security and **compliance** reports.

- Central repository for compliance reports from third-party auditors
- Service Organization Controls (SOC) reports
- Payment Card Industry (PCI) reports

Artifact

Artifact in the Real World

You need to access AWS' certification for ISO compliance.

Artifact provides a central repository for AWS' security and compliance reports via a self-service portal.

Review Time!

Config | GuardDuty
Inspector | Artifact

Config

Config allows you to assess, audit, and evaluate the configurations of your resources.

GuardDuty

GuardDuty is an intelligent threat detection system that uncovers unauthorized behavior.

Inspector

Inspector works with EC2 instances to uncover and report vulnerabilities.

Artifact

Artifact offers on-demand access to AWS security and compliance reports.

Things to Remember When Studying for the Exam

☑ **Config**

Remember that Config allows you to identify changes to various resources over time.

☑ **GuardDuty**

Don't forget GuardDuty identifies malicious or unauthorized activities in your AWS account.

☑ **Inspector**

Don't forget Inspector only works for EC2 instances.

☑ **Artifact**

Don't forget Artifact provides you with compliance reports.

Join us for the next lesson!

A CLOUD GURU

Utilizing Data Encryption and Secrets Management Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. KMS
2. CloudHSM
3. Secrets Manager
4. Review

GET STARTED

The Bigger Picture

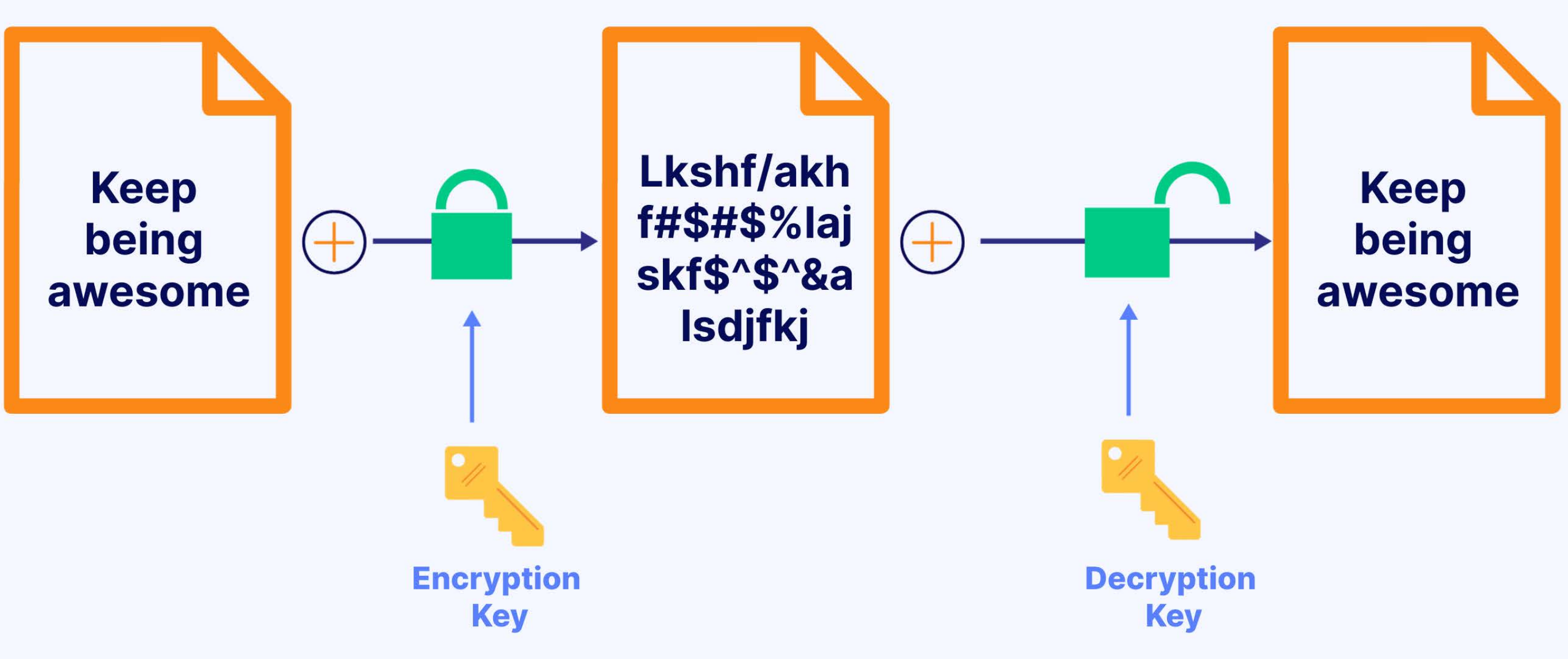
Let's discuss how **data encryption** fits in the bigger picture.

Data encryption **encodes** data so it **cannot be read** by unauthorized users.

Understand the difference between **data in flight** vs. **data at rest**

Data in Flight	Data that is **moving** from one location to another
Data at Rest	Data that is **inactive** or stored for later use

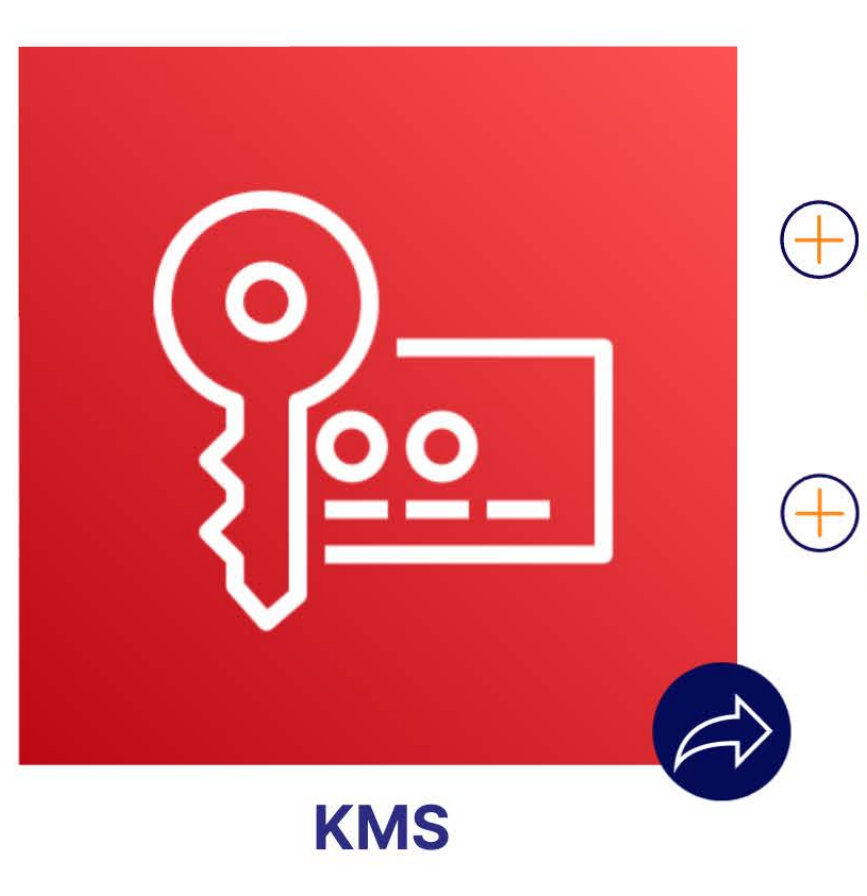
Let's see encryption in action!



KEY MANAGEMENT SERVICE

Key Management Service (KMS)

KMS allows you to generate and store encryption keys.



- Key generator
- Store and control keys
- AWS manages encryption keys
- Automatically enabled for certain services

KMS in the Real World

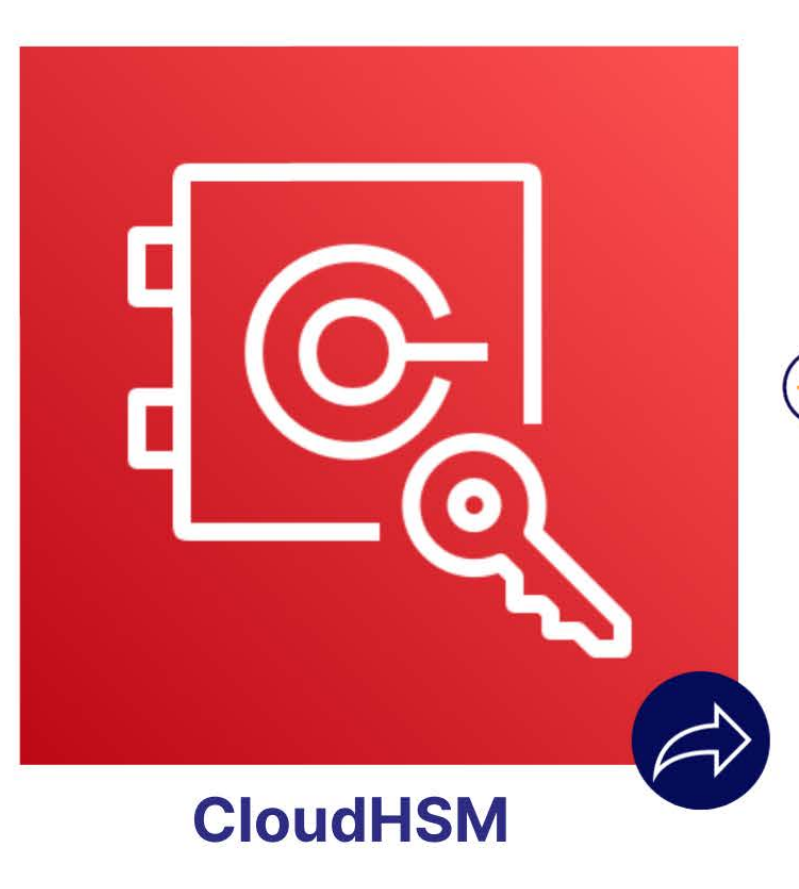
Create encrypted Amazon EBS volumes.

When you create an encrypted Amazon EBS volume, you're able to specify a KMS customer master key.

CLOUDHSM

CloudHSM

CloudHSM is a hardware security module (HSM) used to generate encryption keys.



- Dedicated hardware for security
- Generate and manage your own encryption keys
- AWS does not have access to your keys

CloudHSM in the Real World

Meet compliance requirements for data security by using dedicated hardware.

CloudHSM allows you to meet corporate, contractual, and regulatory compliance requirements for data security by using dedicated hardware in the cloud.

SECRETS MANAGER

Secrets Manager

Secrets Manager allows you to manage and retrieve **secrets** (passwords or keys).

- Rotate, manage, and retrieve secrets
- Encrypt secrets at rest
- Integrates with services like RDS, Redshift, and DocumentDB

Secrets Manager in the Real World

Retrieve database credentials needed for your application code.

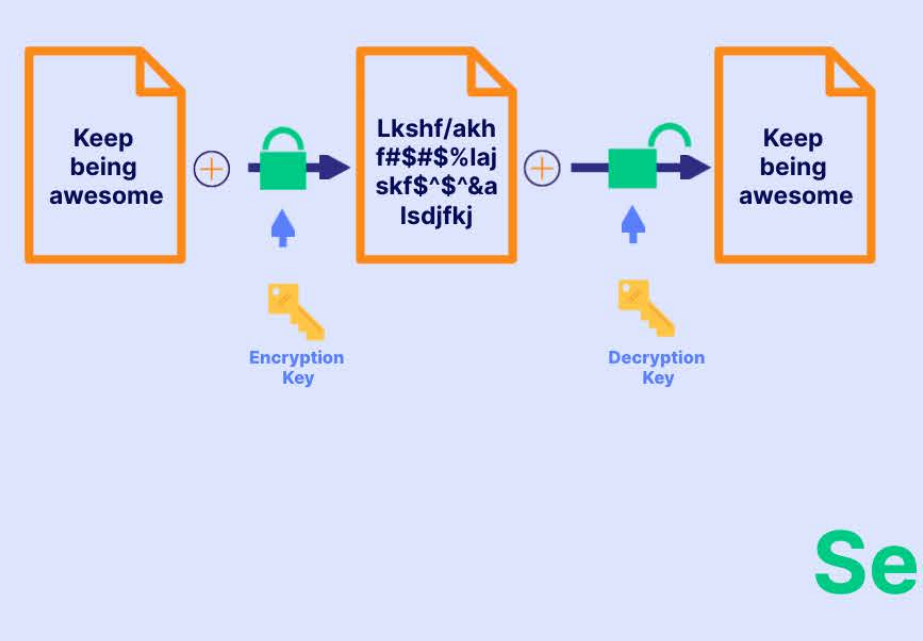
Secrets Manager allows you to retrieve database credentials with a call to Secrets Manager APIs, removing the need to hardcode sensitive information in plain text within your application code.

Review Time!

KMS | CloudHSM | Secrets Manager

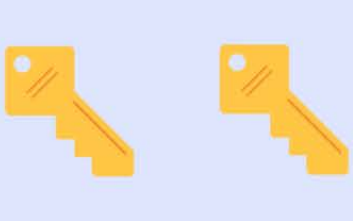
KMS

KMS allows you to generate and store encryption keys.



CloudHSM

CloudHSM is a hardware security module (HSM) used to generate encryption keys.



Secrets Manager

Secrets Manager allows you to manage and retrieve secrets (passwords or keys).

Things to Remember When Studying for the Exam

☑ **KMS**

Going into the exam, don't forget AWS manages KMS keys.

☑ **CloudHSM**

Don't forget you manage the keys generated with CloudHSM.

☑ **Secrets Manager**

Don't forget Secrets Manager has built-in integration for RDS, Redshift, and DocumentDB.

Join us for the next lesson!

A CLOUD GURU

SECTION REVIEW

Security and Compliance

Let's review the services we covered in this section.

Here you'll also be able to link directly to each lesson to get a refresher on the services we discussed in this section.

Shared Responsibility Model

The shared responsibility model outlines your responsibilities vs AWS' when it comes to security and compliance.

Well-Architected Framework

The well-architected framework describes design principles and best practices for running workloads in the cloud.

Security

Identity and Access Management (IAM)

IAM allows you to control access to your AWS services and resources.

Web Application Firewall (WAF)

WAF helps protect your web applications against common web attacks.

Shield

Shield is a managed Distributed Denial of Service (DDoS) protection service.

Macie

Macie helps you discover and protect sensitive data.

Config

Config allows you to assess, audit, and evaluate the configurations of your resources.

GuardDuty

GuardDuty is an intelligent threat detection system that uncovers unauthorized behavior.

Inspector

Inspector works with EC2 instances to uncover and report vulnerabilities.

Artifact

Artifact offers on-demand access to AWS security and compliance reports.

Encryption

Key Management Service (KMS)

KMS allows you to generate and store encryption keys.

CloudHSM

CloudHSM is a hardware security module (HSM) used to generate encryption keys.

Secrets Management

Secrets Manager

Secrets Manager allows you to manage and retrieve secrets (passwords or keys).

Join us for the next lesson!

A CLOUD GURU

Pricing, Billing, and Governance Section Introduction

AWS CERTIFIED CLOUD PRACTITIONER

GET STARTED

Let's take a closer look!

Let's review the services we'll cover in this section.

Here you'll also be able to link directly to each lesson.

Pricing

Application Discovery Service

Application Discovery Service helps you plan migration projects to the AWS Cloud.

Support Plans

Basic

Basic Support is included for free for all AWS accounts.

Developer

Developer Support starts at $29 a month and is recommended for testing and development.

Business

Business Support starts at $100 a month and is recommended for production workloads.

Enterprise

Enterprise Support starts at $15,000 a month and is recommended for business or mission-critical production workloads.

Billing

Budgets

Budgets allows you to set custom budgets that alert you when your costs or usage exceed your budgeted amount.

Cost and Usage Reports

The Cost and Usage Report contains the most comprehensive set of cost and usage data.

Cost Explorer

Cost Explorer allows you to visualize and forecast your costs and usage over time.

Management and Governance

Organizations

Organizations allows you to centrally manage multiple AWS accounts under one umbrella.

Control Tower

Control Tower helps you ensure your accounts conform to company-wide policies.

Systems Manager

Systems Manager gives you visibility into and control over your AWS resources.

Trusted Advisor

Trusted Advisor provides real-time guidance to help you provision your resources following AWS best practices.

Marketplace

Marketplace is a digital catalog of prebuilt solutions you can purchase or license. You may also use it to sell solutions to others.

AWS Partner Network (APN)

APN is a global community of approved partners that offer software solutions and consulting services for AWS.

Managed Services

Managed Services helps you efficiently operate your AWS infrastructure.

Professional Services

Professional Services helps enterprise customers move to a cloud-based operating model.

Join us for the next lesson!

A CLOUD GURU

Understanding AWS Pricing

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Pricing
2. Total Cost of Ownership (TCO)
3. Pricing Calculator
4. Review

GET STARTED

PRICING

Pricing

There are **3** fundamental drivers of cost.

1	2	3
Compute	**Storage**	**Outbound data transfer**
Hourly from launch to termination	**The data you store in the cloud**	**Data in flight moving between systems**

WHITEPAPER

Title: How AWS Pricing Works

Tips:
- Read in full before the exam.
- Review the day before the exam.

Topics: Pricing fundamentals and details for individual services

Pages: 43

Free Offer Types

There are **3** different types of **free** offers available depending on the service you choose.

1	2	3
12 months free	**Always free**	**Trials**
12 months' free usage following your initial sign-up date to AWS	Offers do not expire and are available to all AWS customers	Short-term free trials starting from the date you activate a particular service

AWS services are priced independently!

EC2 Pricing

Don't forget, there are **5** ways to pay for Amazon EC2 instances.

On-Demand	Savings Plan	Reserved Instances	Spot Instances	Dedicated Hosts
You pay by the hour or by the second without pre-paying	Commit to compute usage measured per hour for a 1- or 3-year term	Commit to use for 1 or 3 years; pay regardless of usage	Instances only launch if spare capacity is available	An entire physical server just for you

Don't forget we covered **EC2 pricing** in more detail in the **Exploring Compute Services: EC2** lesson.

Lambda Pricing

Don't forget how you're charged when using Lambda.

Number of requests	Code execution time	Always free
#		1,000,000
Includes test invokes from the console	From execution start, in response to events, to stop	1 million requests per month

Don't forget we covered **Lambda pricing** in more detail in the **Exploring Compute Services: Lambda** lesson.

S3 Pricing

Don't forget with S3, **you pay for the storage you use.**

Storage class	Storage	Data transfer	Request and data retrieval
Various storage classes	Number and size of objects	Data transferred out of S3 Region	Requests made for data and amount of requests

Don't forget we covered **S3 storage classes** in more detail in the **Leveraging Storage Services** lesson.

RDS Pricing

Let's discuss the RDS features that **drive pricing.**

1. **Running clock hours**
2. **Type of database**
3. **Storage**
4. **Purchase type**
5. **Database count**
6. **API requests**
7. **Deployment type**
8. **Data transfer**

Don't forget we discussed **RDS** in the **Utilizing Databases** section.

TOTAL COST OF OWNERSHIP

Have you heard of the Total Cost of Ownership (TCO)?

TCO is a financial estimate that helps you understand both the **direct** and **indirect** costs of AWS.

How much does it cost to migrate to the AWS Cloud?
How can I reduce my Total Cost of Ownership (TCO) using AWS?

There used to be a **TCO Calculator** that is no longer available. However, you will see the term **TCO** on the exam, so understanding what it means is important.

Application Discovery Service

Application Discovery Service helps you plan migration projects to the AWS Cloud.

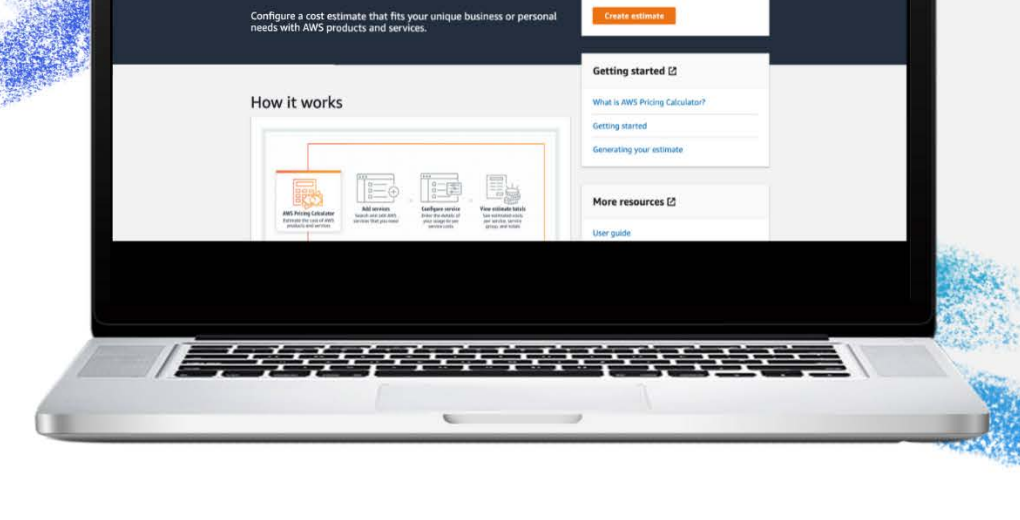
- Plan migration projects
- Used to estimate TCO
- Works with other services to migrate servers

A Few Ways to Reduce Your TCO Using AWS

1	2	3
Minimize capital expenditures	**Utilize** Reserved Instances	**Right** size your resources
AWS helps you **minimize large capital expenditures**, which reduces your TCO.	AWS provides **Reserved Instances** to help you lock in savings and reduce your TCO.	AWS helps you **match** the **provisioning** of resources to your **usage needs** to reduce your TCO.

PRICING CALCULATOR

Let's see how to calculate your TCO using the Pricing Calculator!


AWS Pricing Calculator
Estimate the cost for your architecture solution.

Pricing Calculator

The Pricing Calculator provides an estimate of AWS fees and charges.

- ✓ Explore services based on your use case.
- ✓ Find instance types that fit your needs.

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see the Pricing Calculator in action.

VIDEO IS NOT AVAILABLE ON PDF VERSION

Review Time!

Pricing | TCO | Pricing Calculator

Pricing

There are 3 fundamental drivers of cost: compute, storage, and outbound data transfer.

TCO

TCO is a financial estimate that helps you understand both the direct and indirect costs of AWS.

Pricing Calculator

The Pricing Calculator provides an estimate of AWS fees and charges.

Things to Remember When Studying for the Exam

- ☑ **Pricing Calculator**
  Don't forget the Pricing Calculator helps you calculate the TCO.
- ☑ **TCO**
  Don't forget the ways a company can reduce their TCO.
- ☑ **Pricing**
  Don't forget how pricing is calculated for EC2, Lambda, S3, and RDS.

Join us for the next lesson!

A CLOUD GURU

Understanding Billing Services

AWS CERTIFIED CLOUD PRACTITIONER

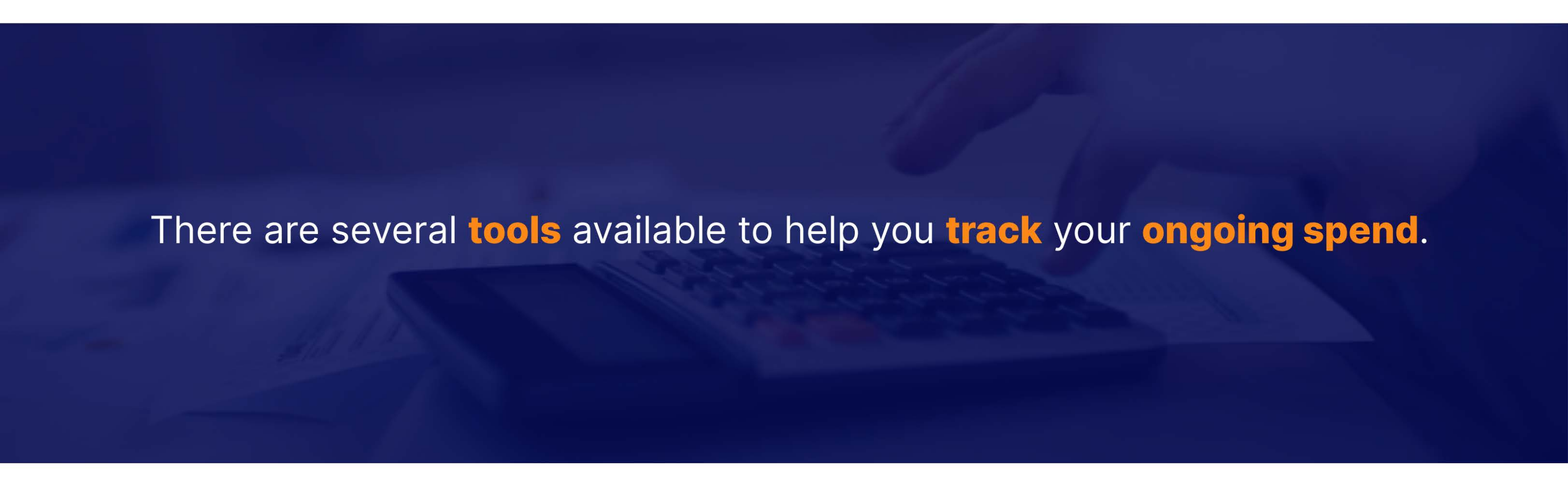
LESSON BREAKDOWN

1. Budgets
2. Cost and Usage Report
3. Cost Explorer
4. Review

GET STARTED

The Bigger Picture

Let's discuss how billing and budgeting services fit in the bigger picture.



There are several **tools** available to help you **track** your **ongoing spend**.

BUDGETS

Budgets

Budgets allows you to set custom budgets that **alert** you when your costs or usage **exceed** your budgeted amount.

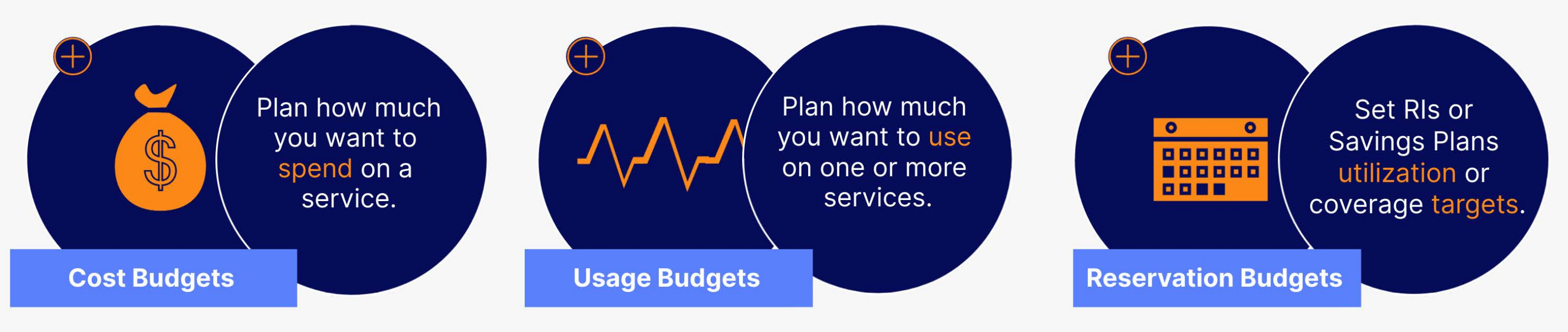
Improve planning and cost control

Cost, usage, and reservation budgets

Budget alerts

Budgets

Budget Types



Cost Budgets: Plan how much you want to spend on a service.

Usage Budgets: Plan how much you want to use on one or more services.

Reservation Budgets: Set RIs or Savings Plans utilization or coverage targets.

AWS DOCUMENTATION

If you'd like to dive deeper into creating budgets, I've provided a link to the official AWS documentation. This additional information is not necessary for the exam.

READ ARTICLE

Budgets in the Real World

Monitor Free Tier usage so you don't incur unwanted costs.

You can monitor Free Tier usage to ensure you don't accidentally exceed Free Tier limits and incur unwanted costs. You can set up an alert notification for when your account is approaching a particular dollar amount.

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see how to set up a billing and budget alert.

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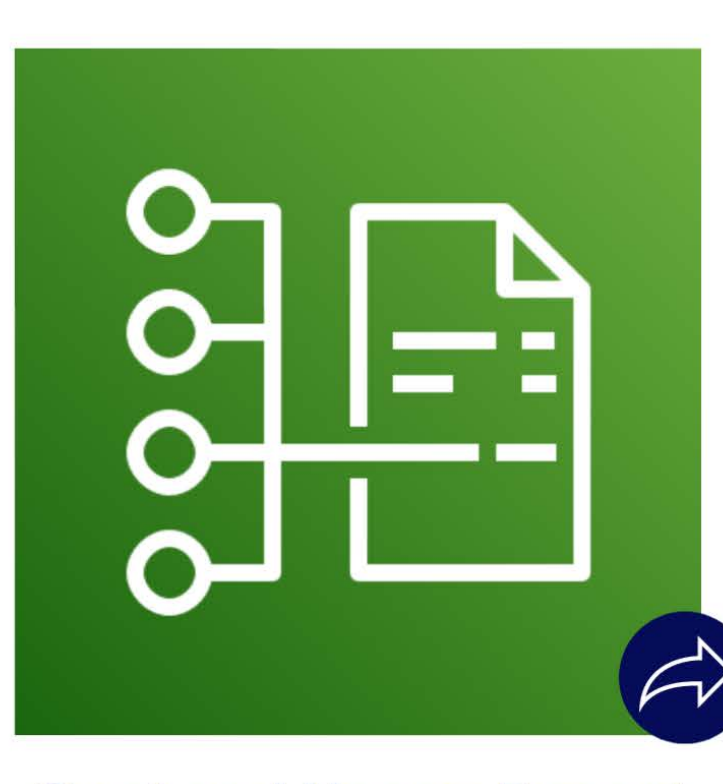
COST AND USAGE REPORT

Cost and Usage Report

The **Cost and Usage Report** contains the most comprehensive set of cost and usage data.



Downloadable detailed and comprehensive report

Lists usage for each service category

Aggregate usage data on a daily, hourly, or monthly level

Cost and Usage Report

Cost and Usage Report in the Real World

View the most granular data about your AWS bill.

The Cost and Usage Report gives you the ability to do a deep dive into your AWS cost and usage data. Once set up, you can download the report using the Amazon S3 console.

COST EXPLORER

Cost Explorer

Cost Explorer allows you to visualize and forecast your costs and usage over time.

Visualize costs over time

View past 12 months

Forecast for up to 3 months

Cost Explorer

Cost Explorer in the Real World

Analyze your EC2 usage over the past 7, 30, or 60 days.

If you are considering your options for Savings Plans, AWS Cost Explorer can analyze your EC2 usage over the past 7, 30, or 60 days.

Watch below for a quick demo!

In this video, you'll see what the AWS platform looks like as well as learn how to navigate through some of the systems on your own. Let's see Cost Explorer in action!

VIDEO IS NOT AVAILABLE ON PDF VERSION

Review Time!

Budgets | Cost and Usage Report | Cost Explorer

Budgets

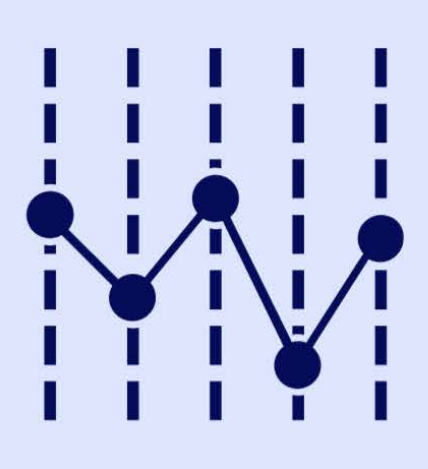
Budgets allows you to set custom budgets that alert you when your costs or usage exceed your budgeted amount.

Cost and Usage Report

The Cost and Usage Report contains the most comprehensive set of cost and usage data.

Cost Explorer

Cost Explorer allows you to visualize and forecast your costs and usage over time.



Things to Remember When Studying for the Exam

☑ **Budgets**

Going into the exam, don't forget you can be alerted when your usage exceeds a defined threshold using Budgets.

☑ **Cost and Usage Report**

Remember that the Cost and Usage Report provides the most detailed set of AWS cost and usage data available.

☑ **Cost Explorer**

Don't forget Cost Explorer helps you visualize and forecast spending.

Join us for the next lesson!

A CLOUD GURU

Exploring Governance Services

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1. Organizations
2. Control Tower
3. Systems Manager
4. Trusted Advisor
5. Review

GET STARTED

The Bigger Picture

Let's discuss how governance and management services fit in the bigger picture.

Governance and management services help you **maintain control** over cost, compliance, and security **across** your AWS accounts.

ORGANIZATIONS

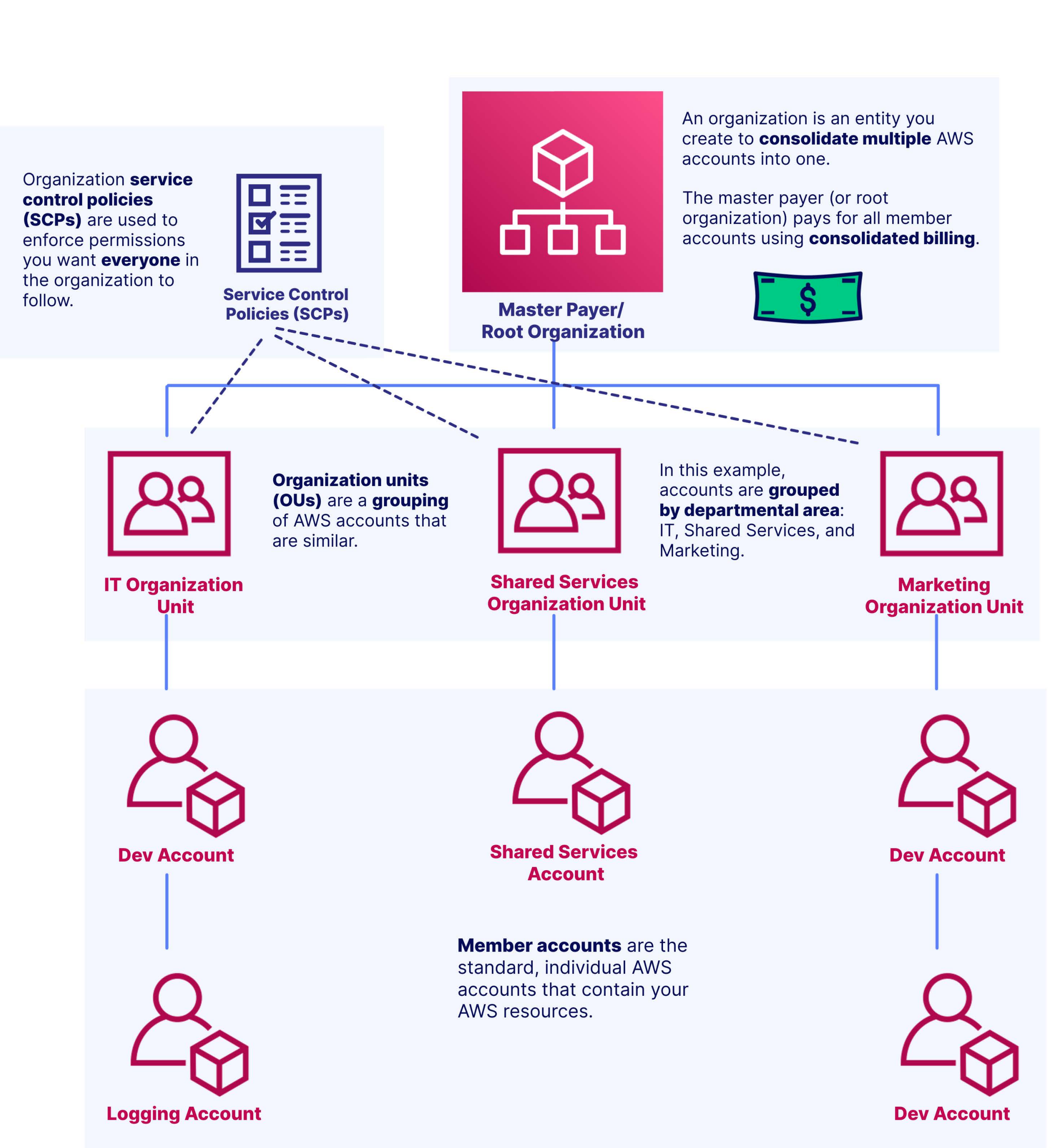
Organizations

Organizations allows you to centrally manage multiple AWS accounts under one umbrella.

- Group multiple accounts
- Single payment for all accounts
- Automate account creation
- Allocate resources and apply policies across accounts

Organizations

Let's take a closer look!



Organization **service control policies (SCPs)** are used to enforce permissions you want **everyone** in the organization to follow.

Service Control Policies (SCPs)

An organization is an entity you create to **consolidate multiple** AWS accounts into one.

The master payer (or root organization) pays for all member accounts using **consolidated billing**.

Master Payer/ Root Organization

Organization units (OUs) are a **grouping** of AWS accounts that are similar.

In this example, accounts are **grouped by departmental area**: IT, Shared Services, and Marketing.

Member accounts are the standard, individual AWS accounts that contain your AWS resources.

What are the benefits?

Organizations offers many benefits.

1 Consolidated Billing

The advantage of consolidated billing is that you receive **one bill** for multiple accounts.

2 Cost Savings

You'll receive **volume discounts** since usage is combined across accounts.

3 Account Governance

You have a quick and automated way to **create** accounts or **invite** existing accounts.

Organizations in the Real World

Reduce costs by sharing resources across accounts.

Organizations allows you to save money using Reserved Instance (RI) sharing. RI sharing allows all accounts in the organization to receive the hourly cost-benefit of RIs purchased by any other account. You can always turn off RI sharing using the master payer (or root) organization.

CONTROL TOWER

Control Tower

Control Tower helps you ensure your accounts conform to company-wide policies.

- Helps set up new accounts using a multi-account strategy
- Works directly with AWS Organizations
- Enforces the best use of services across accounts
- Provides a dashboard to manage accounts

Control Tower

Control Tower in the Real World

Disallow public write access to all S3 buckets across your accounts.

Control Tower allows you to govern your multi-account environment by enabling cross-account security audits or preventing or detecting security issues through mandatory or optional guardrails.

SYSTEMS MANAGER

Systems Manager

Systems Manager gives you visibility and control over your AWS resources.

- Automate operational tasks on your resources
- Group resources and take action
- Patch and run commands on multiple EC2 instances or manage RDS instances

Systems Manager

Automation
Maintenance Windows
Patch Manager

Systems Manager in the Real World

Deploy operating system and software patches automatically across a large group of instances.

Systems Manager allows you to auto-patch software running on EC2 instances according to a schedule.

TRUSTED ADVISOR

Trusted Advisor

Trusted Advisor provides **real-time guidance** to help you provision your resources following AWS best practices.

- Checks your account and makes recommendations
- Helps you see service limits
- Helps you understand best practices

Trusted Advisor

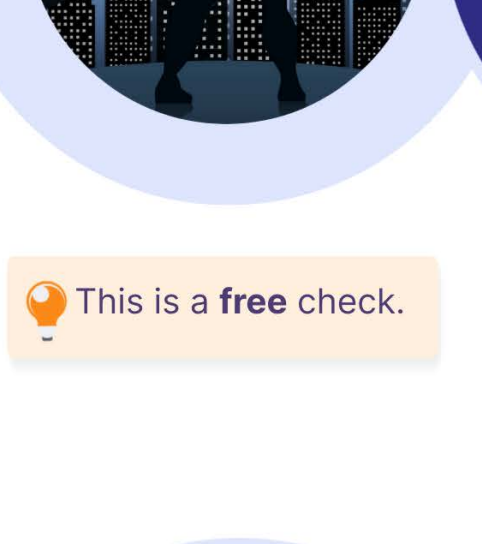
Here are a few popular recommendations made by **Trusted Advisor**

Checks for unrestricted access for specific ports on EC2 instances

This is a **free** check.

Checks S3 bucket permissions to determine if public access

This is a **free** check.



Checks for multi-factor authentication (MFA) on root account

This is a **free** check.

Checks IAM password policy

Enterprise or **Business** Support required for this check.

Checks for RDS public snapshots

This is a **free** check.

Checks for service usage greater than 80% over service limit

Enterprise or **Business** Support required for this check.

Checks for exposed access keys

Enterprise or **Business** Support required for this check.

Checks for CloudFront content delivery optimization

Enterprise or **Business** Support required for this check.

AWS DOCUMENTATION

Trusted Advisor includes an expanding list of checks. I've included a link to the entire list.

Trusted Advisor in the Real World

Check read and write capacity service limits for DynamoDB.

Trusted Advisor helps reduce your overall costs by monitoring service limits.

Review Time!

Organizations | Control Tower | Systems Manager | Trusted Advisor

Organizations

Organizations allows you to centrally manage multiple AWS accounts under one umbrella.

Control Tower

Control Tower helps you ensure your accounts conform to company-wide policies.

Systems Manager

Systems Manager gives you visibility and control over your AWS resources.

Automation
Maintenance Windows
Patch Manager

Trusted Advisor

Trusted Advisor provides real-time guidance to help you provision your resources following AWS best practices.

Things to Remember When Studying for the Exam

☑ **Organizations**

Don't forget Organizations saves you money through consolidated billing. Also, remember the importance of SCPs.

☑ **Control Tower**

Don't forget Control Tower helps you enforce best use of services across your organization.

☑ **Systems Manager**

Remember that Systems Manager helps you maintain your resources through automatic patching and updates.

☑ **Trusted Advisor**

Remember the recommendations made by Trusted Advisor.

Join us for the next lesson!

A CLOUD GURU

Utilizing Management Services

AWS CERTIFIED CLOUD PRACTITIONER

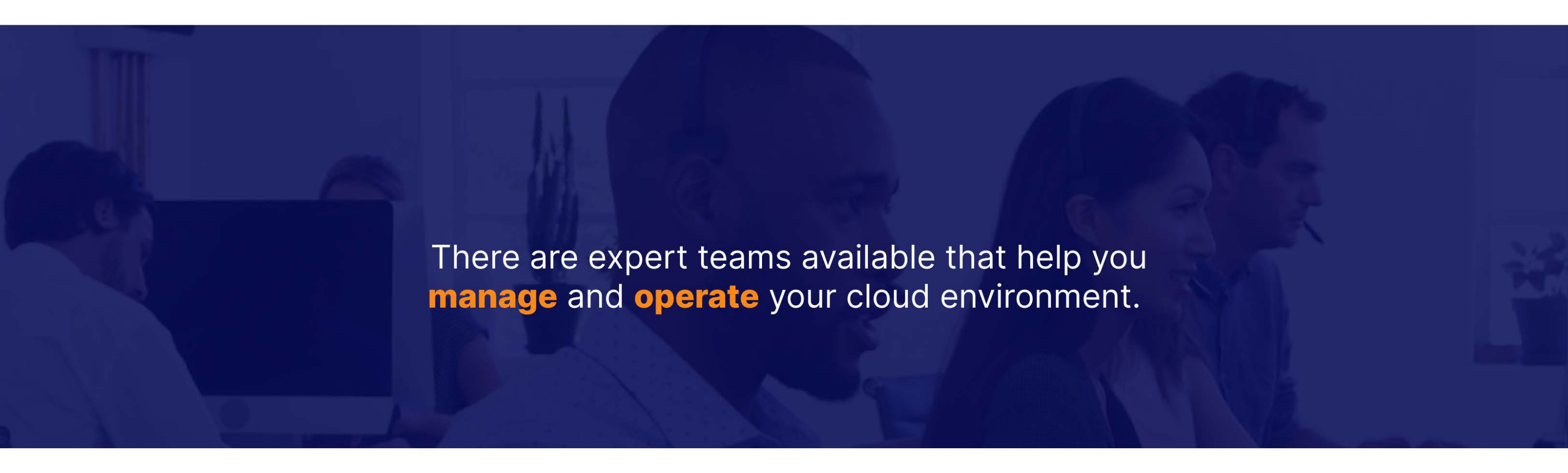
LESSON BREAKDOWN

1. Managed Services
2. Professional Services
3. AWS Partner Network (APN)
4. Marketplace
5. Review

GET STARTED

The Bigger Picture

There are several services that help you migrate to and build faster in the cloud.



There are expert teams available that help you **manage** and **operate** your cloud environment.

MANAGED SERVICES

Managed Services

Managed Services helps you efficiently operate your AWS infrastructure.

- Augments your internal staff
- Provides ongoing management of your infrastructure
- Reduces operational risks and overhead

Managed Services

Compliance

Patch Management

Monitoring

Event Management

Access Management

Security Management

Change Management

Network Management

Monitoring

Continuity Management

Incident Management

Logging

Reporting

Cost Optimization

Managed Services in the Real World

Develop application-specific health monitoring using CloudWatch.

Managed services can increase your operational efficiency by helping you develop application-specific health monitoring using CloudWatch.

PROFESSIONAL SERVICES

Professional Services

Professional Services helps enterprise customers move to a cloud-based operating model.

- Proposes solutions
- Architects solutions
- Implements solutions

Professional Services

Professional Services in the Real World

Get help with evaluating an application for migration to the cloud.

You can quickly move on-premises applications to the cloud using AWS Professional Services.

AWS PARTNER NETWORK

AWS Partner Network (APN)

APN is a global community of approved partners that offer software solutions and consulting services for AWS.

- Offers technology partners that provide software solutions
- Provides consulting partners that offer professional services
- Find approved vendors with deep AWS expertise

APN

APN in the Real World

You need help designing and building a new application.

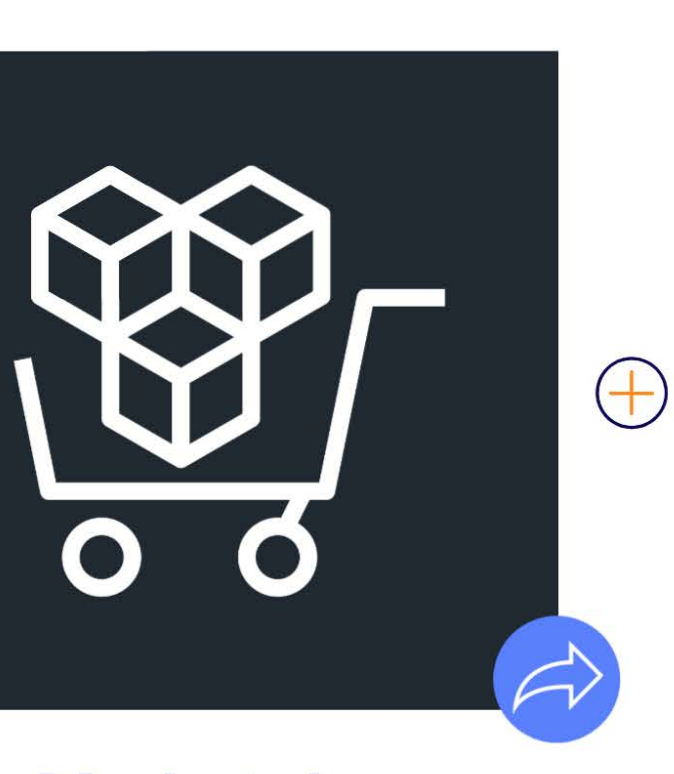
If your team lacks the technical expertise to build and deploy cloud applications, the **APN could help you get up and running quickly**.

MARKETPLACE

Marketplace

Marketplace is a digital catalog of prebuilt solutions you can purchase or license. You may also sell your own solutions to others via Marketplace.

- Buy third-party software
- Sell solutions to AWS customers
- Search the catalog of software listings and install with the click of a button

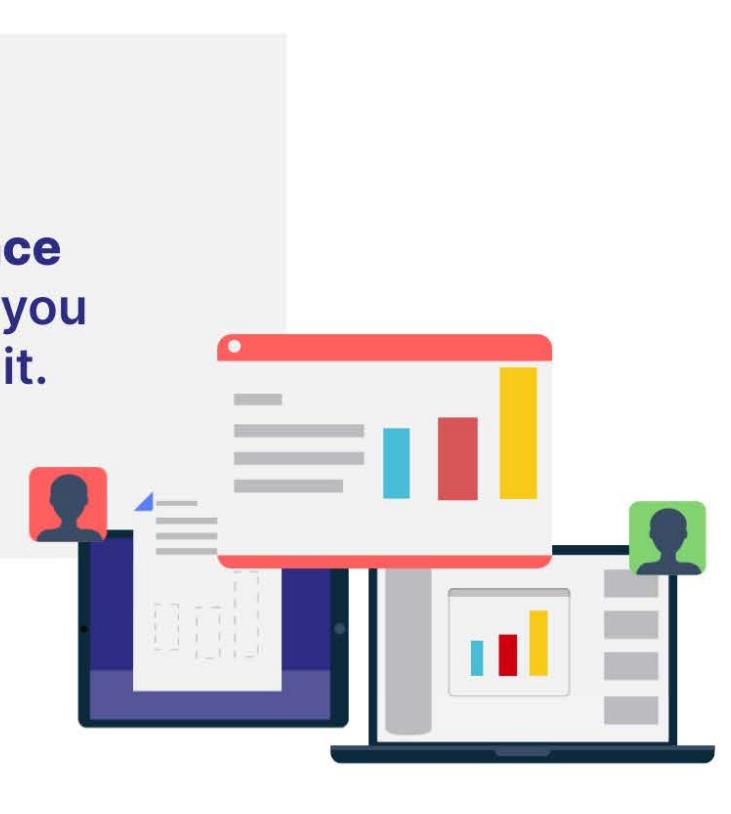


Marketplace

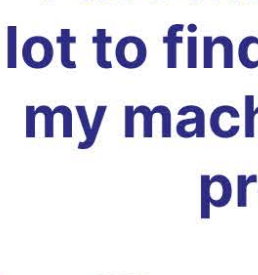
Marketplace in the Real World

Try out an application before making a long-term commitment.

Some products listed on **Marketplace** offer free trials. The free trial allows you to try the software before you buy it.



> I use Marketplace a lot to find datasets for my machine learning projects.



Review Time!

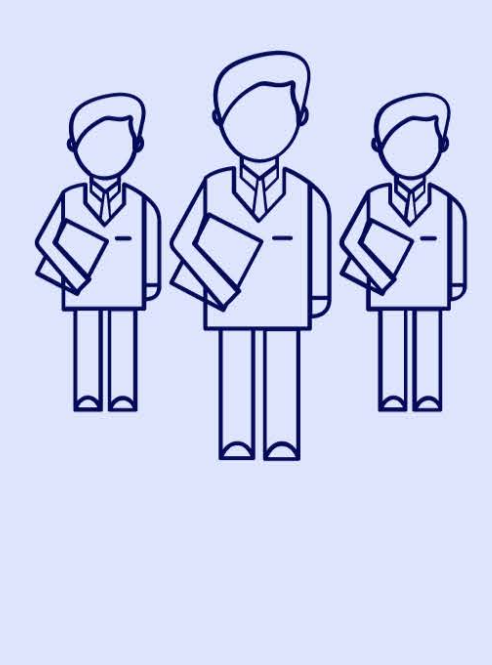
Managed Services | Professional Services | APN | Marketplace

Managed Services

Managed Services helps you efficiently operate your AWS infrastructure.

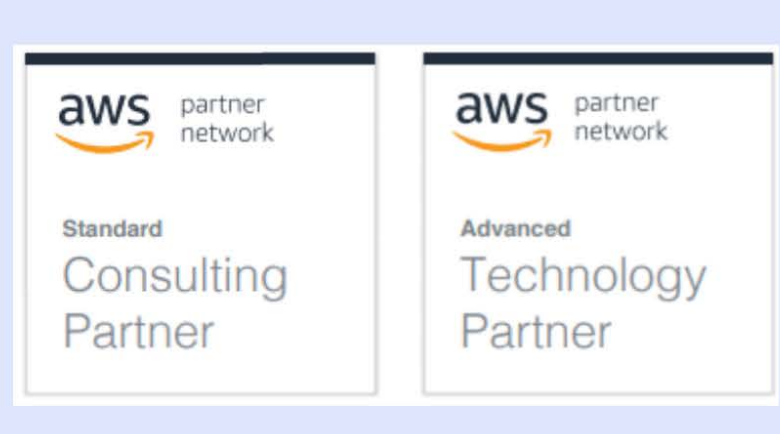
Professional Services

Professional Services helps enterprise customers move to a cloud-based operating model.



APN

APN is a **global community** of approved partners that offer software solutions and consulting services for AWS.



Marketplace

Marketplace is a **digital catalog** of prebuilt solutions you can purchase or license. You can also sell your own solutions to others via Marketplace.

Things to Remember when Studying for the Exam

- ☑ **Managed Services**
  Don't forget Managed Services augments your staff and helps improve your overall operational efficiency.
- ☑ **Professional Services**
  Don't forget Professional Services can help you migrate from on-premises to the cloud.
- ☑ **Marketplace and APN**
  Remember that AWS recognizes partners and providers from these networks.

Join us for the next lesson!

A CLOUD GURU

Exploring Support Plans

AWS CERTIFIED CLOUD PRACTITIONER

LESSON BREAKDOWN

1 Basic
2 Developer
3 Business
4 Enterprise
5 Review

GET STARTED

Support Plans

There are **4** support plans.

FREE

1 Basic
Basic Support is included for **free** for all AWS accounts.

2 Developer
Developer Support starts at **$29** a month and is recommended for testing and development.

3 Business
Business Support starts at **$100** a month and is recommended for production workloads.

4 Enterprise
Enterprise Support starts at **$15,000** a month and is recommended for business or mission-critical production workloads.

Support Case Types

There are **3** types of support cases you can open with **AWS Support**.

1 Account and billing
Account-related and billing cases can be opened by all customers.

2 Service limit increases
Default service quota (or limit) increases can be opened by all customers.

3 Technical support
Technical support cases can only be opened by customers on the Developer, Business, or Enterprise plans.

AWS Support does **not** allow cases for code development, debugging custom software, or performing system administration tasks.

BASIC

Basic Support Plan

Basic Support is included for free for all AWS accounts.

- Account and billing
- Service limit increases

Customer Service
24/7 access via **email** only

DEVELOPER

Developer Support Plan

Developer Support starts at **$29 a month** and is recommended for testing and development.

- Account and billing
- Service limit increases
- Technical support

1 Primary Contact

Unlimited Cases

Cloud Support Associate
Business-hours access via email only

Response Times
<24 hours General guidance
<12 hours System impaired

BUSINESS

Business Support Plan

Business Support starts at **$100 a month** and is recommended for production workloads.

- Account and billing
- Service limit increases
- Technical support

Unlimited Contacts

Unlimited Cases

Full Set of Trusted Advisor Checks

Cloud Support Engineers
24/7 access via email, phone, or chat

Response Times
<24 hours General guidance
<4 hours Production system impaired
<12 hours System impaired
<1 hour Production system down

ENTERPRISE

Enterprise Support Plan

Enterprise Support starts at **$15,000 a month** and is recommended for business or mission-critical production workloads.

- Account and billing
- Service limit increases
- Technical support

Unlimited Contacts

Unlimited Cases

Technical Account Manager **(TAM)**

Concierge Support Team

Infrastructure Event Management

Full Set of Trusted Advisor Checks

Cloud Support Engineers
24/7 access via email, phone, or chat

Response Times
<24 hours General guidance
<4 hours Production system impaired
<12 hours System impaired
<1 hour Production system down
<15 minutes Business-critical system down

Review Time!

Basic | Developer | Business | Enterprise

Basic

Basic Support is included for free for all AWS accounts.

Developer

Developer Support starts at $29 a month and is recommended for testing and development.

Business

Business Support starts at $100 a month and is recommended for production workloads.

Enterprise

Enterprise Support starts at $15,000 a month and is recommended for business or mission-critical production workloads.

Things to Remember When Studying for the Exam

☑ **Basic Support**

Don't forget how to open tickets and the types of tickets you're allowed to open.

☑ **Business Support**

Don't forget how to open tickets and the types of tickets you're allowed to open.

Remember this support plan includes the full set of Trusted Advisor checks.

☑ **Developer Support**

Don't forget how to open tickets and the types of tickets you're allowed to open.

☑ **Enterprise Support**

Don't forget how to open tickets and the types of tickets you're allowed to open.

Remember this support plan includes the full set of Trusted Advisor checks.

Don't forget this support plan provides access to a Technical Account Manager (TAM) and the Concierge Support Team.

Join us for the next lesson!

SECTION REVIEW

Pricing, Billing, and Governance

Let's review the services we covered in this section.

Here you'll also be able to link directly to each lesson to get a refresher on the services we discussed in this section.

Pricing

Application Discovery Service

Application Discovery Service helps you plan migration projects to the AWS Cloud.

Support Plans

Basic

Basic Support is included for free for all AWS accounts.

Developer

Developer Support starts at $29 a month and is recommended for testing and development.

Business

Business Support starts at $100 a month and is recommended for production workloads.

Enterprise

Enterprise Support starts at $15,000 a month and is recommended for business or mission-critical production workloads.

Billing

Budgets

Budgets allows you to set custom budgets that alert you when your costs or usage exceed your budgeted amount.

Cost and Usage Reports

The Cost and Usage Report contains the most comprehensive set of cost and usage data.

Cost Explorer

Cost Explorer allows you to visualize and forecast your costs and usage over time.

Management and Governance

Organizations

Organizations allows you to centrally manage multiple AWS accounts under one umbrella.

Control Tower

Control Tower helps you ensure your accounts conform to company-wide policies.

Systems Manager

Systems Manager gives you visibility into and control over your AWS resources.

Trusted Advisor

Trusted Advisor provides real-time guidance to help you provision your resources following AWS best practices.

Marketplace

Marketplace is a digital catalog of prebuilt solutions you can purchase or license. You may also use it to sell solutions to others.

AWS Partner Network (APN)

APN is a global community of approved partners that offer software solutions and consulting services for AWS.

Managed Services

Managed Services helps you efficiently operate your AWS infrastructure.

Professional Services

Professional Services helps enterprise customers move to a cloud-based operating model.

Join us for the next lesson!

A CLOUD GURU

Conclusion and What’s Next

AWS CERTIFIED CLOUD PRACTITIONER

Congratulations on completing the course!

VIDEO IS NOT AVAILABLE IN PDF VERSION
A CLOUD GURU
KESHA WILLIAMS

> Good luck with the exam! I can't wait to hear about your results!

See you next time!